US Army Corps of Engineers®

COST ANALYSIS FOR THE 2000 ISSUANCE AND MODIFICATION OF NATIONWIDE PERMITS

Institute for Water Resources

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List of Acronyms

AED	average evaluation days
CWA	Clean Water Act
FY	Fiscal Year
GC	general condition
GP	general permit
LOP	letter of permission
NWP	nationwide permit
PCN	pre-construction notification
RAMS	Regulatory Analysis and Management System
RGP	regional general permit
SP	standard permit

EXECUTIVE SUMMARY

The US Army Corps of Engineers (Corps) issues two categories of Clean Water Act (CWA) Section 404 permit authorizations for discharges of dredged or fill material into "waters of the United States"—individual (standard) and general. The latter includes a set of "nationwide permits" (NWPs) that authorize, on a national basis, discharges associated with certain categories of activities deemed to result in no more than minimal adverse effects on the aquatic environment.

On March 9, 2000, the Corps published a final notice in the *Federal Register* announcing the issuance of 5 new nationwide permits (NWPs) and the modification of 6 existing NWPs to replace NWP 26 when it expired on June 7, 2000. NWP 26 previously authorized discharges of dredged or fill material into headwaters and isolated waters associated with a wide variety of activities. Each of the replacement permits apply to a specific category of activities, and establish lower impact limits and impact thresholds for determining when reporting to the Corps is required. The Corps also issued 2 new and 9 modified NWP general conditions that apply to broad sets of NWPs. The modified general conditions establish certain new requirements for authorized activities. For example, one modified general condition places new emphasis on the use of vegetative buffers along open waters at project sites to mitigate permitted impacts. The *new* general conditions prohibit certain permanent above-grade fills in waters of the US within the 100-year floodplain, and prohibit discharges in "designated critical resource waters" and adjacent wetlands. Taken together, the new and modified NWPs and general conditions affect permitting and associated regulatory costs for a large set of activities previously authorized under NWP 26 and other NWPs.

In March 2000, the Corps released the report *Cost Analysis for the 1999 Proposal to Issue and Modify Nationwide Permits* which reported estimates of increased permitted workload and compliance costs associated with changes to the nationwide permit program that were proposed on July 21, 1999. But the program changes that were actually issued by the Corps on March 9, 2000 differed in significant ways from the July 1999 proposal that was the subject of that cost assessment. The FY 2001 Energy and Water Development Appropriations Bill required the Corps to revisit the analysis of permitting workload and costs to reflect the actual program changes (or "replacement package) issued on March 9, 2000. This report presents the revised analysis of the permitting changes and incremental compliance costs for the actual replacement package issued by the Corps.

The replacement package is estimated to result in 2,500 additional standard permit (SP) applications annually. The added SP applications would increase by about 25% the number of standard permit applications received by the Corps in fiscal year 1998 (FY 98). Approximately 87% of these permit shifts are due to the activity restrictions and impact limits established by the replacement permits, and the rest are driven by the new general conditions prohibiting certain fills within 100-year floodplains and discharges in designated critical resource waters.

The expected permitting changes increase direct (cash) compliance costs by an estimated $29 million annually. These direct costs reflect out-of-pocket expenses incurred by the regulated community to complete permit applications and comply with permit conditions, including required compensatory mitigation.

The replacement package also imposes indirect costs on the regulated community that are not necessarily reflected in out-of-pocket expenses. Two partial measures of indirect compliance costs were estimated. First, an illustrative estimate of development value potentially foregone as a result of the new emphasis on requiring vegetative buffer along open waters at project sites was developed for residential development activities (which accounted for approximately 20% of reported NWP 26 activities in FY 98).

This suggests that the buffer provision could impose annual opportunity costs of roughly $5 million on the residential development sector. This is based on a series of assumptions that cannot be verified.

Another indirect compliance cost potentially imposed by the replacement package relates to increased permitting time. A permitting time analysis was used to predict systemic effects of the replacement package on the amount of time it takes the Corps to process SP applications, assuming that the Corps' annual permitting budget would remain roughly at the FY 98 level. The analysis suggests that the average time it takes the Corps to process a SP application, and the number of end-of-year pending applications awaiting Corps processing, would rise steadily each year under the replacement package. In the third year under the replacement package, average SP processing time and the number of pending applications are predicted to reach nearly twice their FY 98 levels. In year 5, processing time and pending applications would increase to 2-3 times the levels experienced in FY 98. While the opportunity costs of increased permitting delay could not be assessed in dollar terms, these costs could potentially be a significant element of compliance costs resulting from the replacement package.

In principle, the additional permitting time costs could be avoided if the Corps' permitting budget were increased sufficiently. In other words, there is a likely tradeoff between the level of Corps budget for processing permits and the level of permitting time costs borne by the regulated community. The study estimated the increase in regulatory program budget that the Corps would need to implement the replacement package while maintaining FY 98 levels of permitting efficiency (i.e., permit application processing times). An estimated additional $7 million would be needed annually, or almost 8% more than the Corps spent on processing permits in FY 98.

Three items should be noted. First, the estimated increased budget will not eliminate the year-to-year carryover. Rather, it would address the increasing carryover, or backlog by reducing that carryover to levels that occurred prior to implementation of the replacement nationwide permits. Second, other factors can contribute to increasing average evaluation days and carryover, such as increased Endangered Species Act coordination requirements. Finally, the analysis of permit processing costs is best suited for estimating the effects on costs of marginal changes in permitting workload. To the extent that the replacement package leads to a non-marginal increase in permitting workload, then the costs for permit processing might also change significantly.

ACKNOWLEDGMENTS

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Paul Scodari (IWR Visiting Economist) conducted the study and prepared this report with assistance from Dr. Robert Brumbaugh (IWR), David Olson (IWR), Dr. Jeff Mullen (University of Georgia), and Meg Gaffney-Smith (IWR). Corps Headquarters (HQUSACE) Regulatory Branch oversight was provided by John Studt. Jack Chowning and Frank Torbett of the HQUSACE Regulatory Branch helped IWR acquire and understand Corps regulatory data, and Applied Systems Consultants, Inc. assisted in data acquisition and formatting.

1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE

The US Army Corps of Engineers (the Corps) is the chief administrative agency for the Clean Water Act (CWA) Section 404 program that regulates the discharge of dredged or fill material into "waters of the United States," which includes most wetlands and other "special aquatic sites." The Corps issues two categories of Section 404 permits--individual and general. The latter includes a set of "nationwide permits" (NWPs) that authorize, on a national basis, discharges associated with certain categories of activities deemed by the Corps to result in no more than minimal adverse effects on the aquatic environment.

On March 9, 2000, the Corps published in the *Federal Register* (65 Fed. Reg. 12818) a final notice announcing the issuance of five new and six modified NWPs to replace NWP 26, which expired on June 7, 2000. NWP 26 authorized the discharge of dredged or fill material into headwaters and isolated waters, provided that the discharge did not result in the loss of greater than three acres of waters of the US or 500 linear feet of stream bed.

Unlike NWP 26, the replacement permits apply to specific types of activities, and most authorize discharges in all non-tidal waters of the US, except non-tidal wetlands adjacent to tidal waters. The replacement permits also establish more restrictive terms for authorized activities, including lower impact limits and lower thresholds for determining when pre-construction notification (i.e., submission of a permit application) to the Corps is required. The purpose of the replacement permits is to comply with CWA Section 404(e), which specifies that activities authorized under any one general permit must be similar in nature, and result in no more than minimal adverse effects on the aquatic environment.

In the same *Federal Register* notice, the Corps also announced the modification of nine NWP general conditions and the adoption of two new general conditions. These modified and new general conditions apply to broad sets of NWPs, including the replacement permits. The modified general conditions impose miscellaneous new requirements for activities authorized under NWPs. For example, one modified general condition places new emphasis on the use of vegetative buffers along rivers, streams, and other open water bodies at project sites to mitigate permitted impacts. The two new general conditions prohibit discharges in designated "critical resource waters" and adjacent wetlands, and discharges resulting in permanent above-grade fills in waters within 100-year floodplains. Taken together, the new and modified NWPs and general conditions will significantly affect Section 404 permitting and associated regulatory costs.

In March 2000, the Corps released the report *Cost Analysis for the 1999 Proposal to Issue and Modify Nationwide Permits* which reported estimates of increased permitted workload and compliance costs associated with changes to the nationwide permit program that were proposed on July 21, 1999. However, the program changes that were actually issued by the Corps on March 9, 2000 differed in significant ways from the July 1999 proposal that was the subject of that cost analysis. The FY 2000 Energy and Water Development Appropriations Bill required the Corps to revisit the analysis of permitting workload and costs to reflect the actual program changes (or "replacement package) issued on March 9, 2000. This report presents the revised analysis of the permitting changes and incremental compliance costs for the actual replacement package issued by the Corps.

The report is organized as follows: The remainder of this section briefly reviews the general assessment approach followed, the specific elements of the replacement package analyzed, and operational assumptions used to bound the analysis. Sections 2 and 3 review the methods and data used to estimate permitting and cost changes, respectively. The study findings are summarized in Section 4. Appendices A-C provide more detail on the replacement package provisions and the methods, data, and assumptions used to assess permitting and cost effects.

1.2 GENERAL APPROACH

The analytical framework used in this study is presented in Figure 1.1. The framework includes two main parts: 1) Estimation of permitting changes resulting from the replacement package, and; 2) Estimation of unit changes in direct compliance costs corresponding to the estimated permitting changes. The permitting change analysis involves identifying those activities authorized in some base year under the current program that would have been required to obtain alternative or modified permits if the replacement package had been in effect at that time. The cost change analysis involves identifying differences in permit requirements and costs corresponding to each type of permit change identified. Estimated permit changes, by type, are then multiplied by their corresponding unit compliance cost changes to calculate incremental costs. Costs for each type of permit change are then combined to calculate total incremental direct costs of the replacement package.

Data on FY 1998 permit authorizations were used to implement the analysis. That is, the number and characteristics of activities authorized by NWPs in that year were used to characterize the analytical baseline (i.e., current program scenario) and to identify annual permitting changes and associated costs resulting from the replacement package.

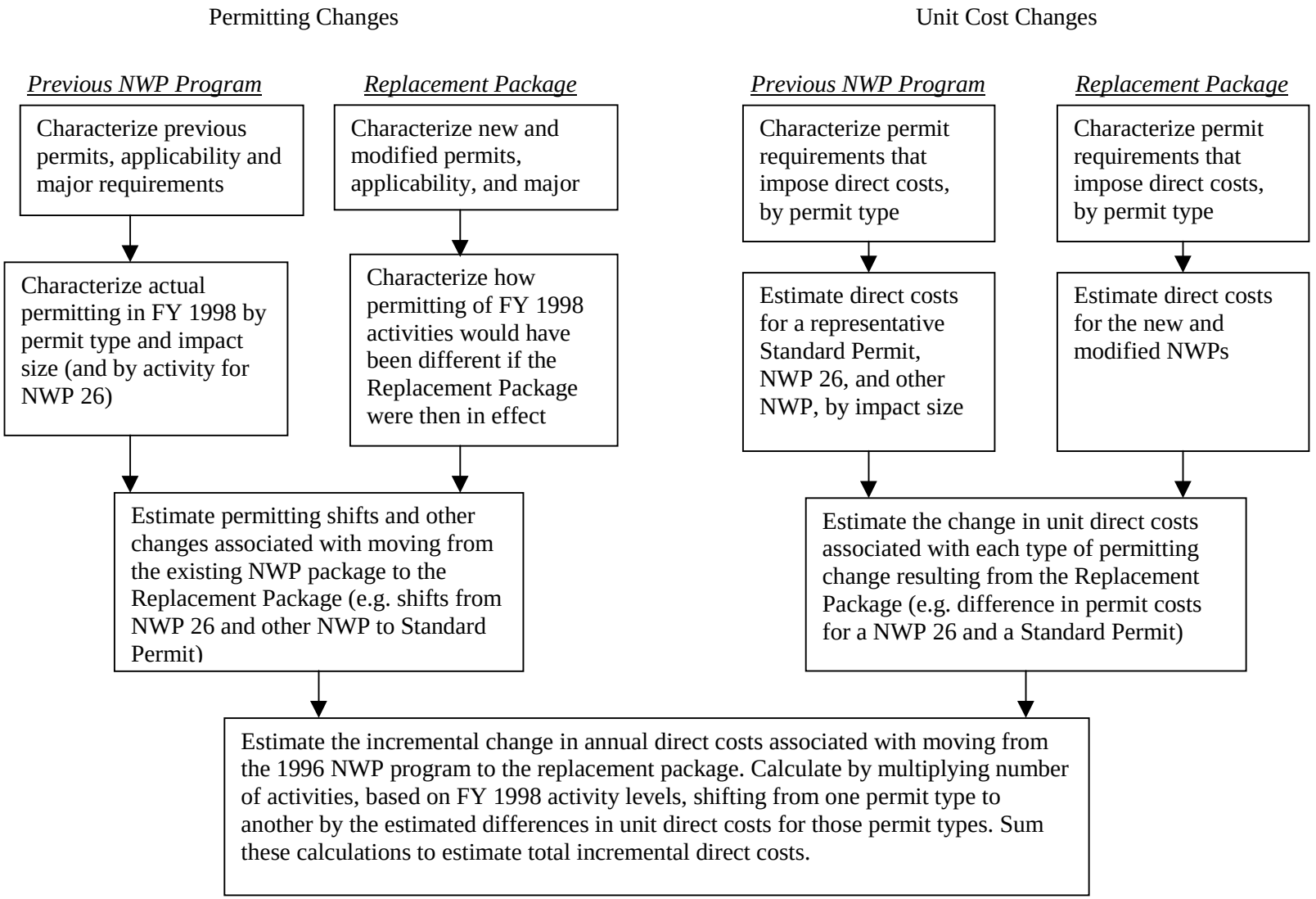
1.2.1 Compliance Costs

Compliance costs incurred by the regulated community can be divided into two types: direct (cash) costs and indirect (opportunity) costs.[1] Direct costs reflect the out-of-pocket expenses necessary to complete permit applications and comply with permit conditions, including required compensatory mitigation. The indirect costs of permitting represent other compliance costs that are not necessarily reflected in out-of-pocket expenses. These include permitting time costs and any development profits foregone as a result of the need to re-design projects or reserve portions of project areas for compensatory mitigation.

Both direct and indirect compliance costs would be expected to increase as a result of the replacement package. However, the assessment of compliance costs in dollar terms focused primarily on direct costs. While the importance of indirect costs is recognized, estimation of these costs is complicated by, among other things, the wide variability in the types and characteristics of potentially affected activities and the economic settings in which they occur, and the variety of ways that indirect costs can be manifested. The data and level of analysis needed to adequately investigate indirect costs are beyond the time and resources available for this study. As a second best approach, two partial measures of indirect costs were estimated.

[1] Environmental regulations often impose various direct and indirect costs (see: Jaffe et al., 1995).

Figure 1.1 Framework for Analysis of Permitting and Cost Changes



First, a permitting time analysis was used to predict systemic effects of the replacement package on the time it takes for Corps processing of standard permit (SP) applications as a way to proxy the opportunity costs of increased permitting delay. This analysis proceeded under the following assumptions: 1) Corps district regulatory branches are currently operating at full capacity, and; 2) Corps districts' annual permitting budgets would remain roughly at current levels. If these assumptions hold, then the increased permitting workload resulting from the replacement package would be expected to result in longer permit application processing times and more permit applications pending processing. These two indicators of permitting time were predicted for each of five years under which the replacement package would be in effect, based on the estimated increase in SP workload in those years.

Second, an illustrative estimate of development value foregone as a result of the new vegetative buffer requirement was calculated for residential development activities. These activities more than any other have traditionally relied on NWP 26, and thus might be the most affected by the new buffer requirements. This analysis was based on a set of assumptions relating to the share of residential development activities required to establish buffers, land area of affected activities set aside for buffers, and the development value of affected lands.

1.2.2 Administrative Costs

The permitting time analysis outlined above assumed that Corps district permitting budgets would remain roughly at FY 98 levels, resulting in decreased permitting efficiency. In that case, increased permitting time costs (i.e. opportunity cost of permitting delays) would be forced on to the regulated community. In other words, there is a trade-off between permitting time costs borne by the regulated community and the level of the Corps regulatory budget available for processing permits.

In recognition of this trade-off, the study also developed an estimate of the additional Corps regulatory program budget (i.e., funding for added Corps regulatory staff) that would be needed for the Corps to implement the replacement package while maintaining the FY 98 level of permitting efficiency. The analysis of Corps administrative costs relied on an estimated equation relating annual district permitting budget to the number of each permit type processed in the Corps districts in FY 98.

1.3 SCOPE OF ANALYSIS

The replacement package affects permitting in three main ways that are more costly for the regulated community and the Corps. First, some activities that previously used NWPs would not now qualify for NWP authorization due to the terms established by the replacement permits, and the prohibitions imposed by the new general conditions. These activities must instead obtain authorization through the more time- and resource-intensive SP process. Second, some NWP activities that previously were not required to report to the Corps before proceeding are now required to submit a pre-construction notification (PCN). This essentially requires the submission of NWP application where none was formerly needed. Third, some NWP activities would now need to comply with certain new requirements imposed by the new and modified general conditions. The vegetative buffer provision of modified General Condition 19 is one such new requirement. The replacement permits and general conditions thus affect permitting and costs for activities previously authorized under NWP 26, and to a lesser extent activities authorized under other NWPs.

The analysis considered the most significant replacement package provisions in terms of likely permitting and cost effects. Those additional activities requiring a SP due to the terms of the replacement permits as well as the prohibitions imposed by General Condition 25 (designated critical resource waters) and General Condition 26 (above-ground fills within the 100-year floodplain) were estimated. The

incremental direct costs of these permitting changes were estimated, as were possible systemic effects of increased permit workload on the Corps permit application processing times and application backlogs. Finally, an estimate of vegetative buffer costs was developed for residential development activities that is suggestive of the potential effects of buffer requirements on indirect compliance costs.

The possible effects on the regulated community and the Corps of other, less significant, replacement package provisions were not addressed by the cost analysis. For instance, it is expected that there would be at least some permit shifts from SPs to NWPs, since the scope of applicable waters for most of the new and modified NWPs is broader than the applicable waters for NWP 26. However, estimation of these permit shifts was precluded by data availability. While these (likely very limited) permit shifts would produce savings in compliance and administrative costs, lack of accounting for them in this study is not critical since their effects on permitting and regulatory costs are likely much less significant than the provisions that were evaluated.

1.4 STUDY ASSUMPTIONS

The analysis proceeded under several important operational assumptions. These relate to: 1) regional conditioning for the new and modified NWPs by Corps districts; 2) the option for individual Corps districts to implement alternative permitting approaches for activities that would otherwise be regulated under the replacement package, and; 3) the interface between the Federal Section 404 program and related state and local programs.

The replacement package requires each Corps district to add district-specific regional conditions to the new and modified NWPs to ensure that authorized activities cause no more than minimal adverse effects on the aquatic environment. At the same time, any Corps district could choose to implement alternative permitting approaches, including "letters of permission" or "regional general permits," for at least some activities that would otherwise be covered by the new and modified NWPs and general conditions. District-specific regional conditioning and substitute regulatory tools would of course alter the replacement package as implemented in different districts. For practical reasons, the cost analysis presented here did not consider regional conditioning or alternative regulatory approaches. It was instead assumed for analytical purposes that the replacement package would be implemented in the same form across all Corps districts.

The study also implicitly assumes that the existence of state and local regulatory programs will not affect the degree to which the replacement package imposes new compliance costs on the regulated community. Many states and localities administer their own regulatory programs for activities in aquatic environments. It is possible that some state and local programs already impose some of the same requirements on activities that would be newly required by the replacement package. To the extent that this is the case in some areas, then duplicate requirements mandated by the replacement package would not impose additional compliance costs in those areas. This possibility was ignored in the cost analysis.

1.5 RELATIONSHIP TO PREVIOUS COST STUDY

As previously indicated, the Corps conducted an earlier analysis of compliance cost and workload effects associated with changes to the nationwide permit program that were proposed on July 21, 1999.[2] The cost and workload analysis reported here for the replacement package that was actually issued on March

[2] US Army Corps of Engineers. 2000. *Cost analysis for the 1999 proposal to issue and modify nationwide permits*. Institute for Water Resources. (January).

9, 2000 relied on the same analytical approach, assessment methods and data sources used in that previous analysis. Nevertheless, the permitting change and incremental cost analyses used in this revised study differed slightly from the previous analysis, as outlined below.

The permitting change analysis reported here differed in two main ways from that used in the previous study. First, a more complete data set was used in the revised analysis. Thus, the set of NWP 26 and other NWP activities used to calculate permit shifts differed somewhat from the set of activities modeled in the previous analysis. Second, the previous study hypothesized that the lower reporting thresholds for the replacement permits would increase the number of activities that would be reported to the Corps and thus incur regulatory costs. Since these previously "unreported" activities were not part of the data set used to model permitting effects, a number of assumptions were employed to predict the number of activities that would be newly reported to the Corps as a result of program changes. The permitting change analysis reported here, however, does not include an assessment of possible permitting effects on previously unreported activities, but instead assumes that the lower reporting thresholds included in the replacement package will not result in any increase in reported activities. The basis and supporting evidence for this assumption are reviewed in Section 2.1.3.

The incremental cost analysis reported here also differs in two main ways from that used in the previous study. First, the estimated unit incremental compliance cost applied to activities predicted to shift from NWP to SP is slightly higher than that used in the previous analysis, even though it relied on the same data source. The reason is that the previous analysis tried to account for the effect of project impact size on permit application costs, while the analysis reported here does not. The study authors no longer believe that adjustment of incremental compliance costs to reflect impact size is useful for assessing replacement package costs, since it can not be assumed that impact size will remain constant for activities predicted to shift from NWP to SP.

The second change affecting the cost analysis relates to the estimation of added Corps costs for administrating the CWA Section 404 permit program. The analysis of Corps costs reported here was changed somewhat to reflect the fact that the Corps incurs administrative costs for each SP application received, even if that application is eventually withdrawn. The effect of this change is to increase slightly the estimated incremental Corps administrative costs associated with activities that shift from NWP to SP.

2. ESTIMATION OF PERMITTING CHANGES

The various ways in which the replacement package considered here can affect Section 404 permitting are shown in Figures 2.1a-c. The figures indicate possible permitting effects on activities previously authorized under NWP 26 and other NWPs.

For the analysis of permitting effects, thirty-five districts provided permit-level data from the Corps Regulatory Analysis and Management System (RAMS) database for Fiscal Year 1998 (FY 98).[3] Use of FY 98 permitting data to represent the previous NWP program scenario and to model the replacement package scenario assumes that the number and types of activities authorized under the program in that year are representative of those that will seek permit authorization in each year in which the replacement package would be in effect. The analysis also relied on the following simplifying assumptions:

1. Applicants whose activities qualify for a new or modified NWP would choose to pursue that type of permit authorization rather than go through the SP process.
2. Applicants whose activities were previously authorized under NWP 26 but would not qualify for any of the new or modified NWPs would instead apply for and receive SP authorization.
3. Applicants who must rebut a presumption of more than minimal impacts or meet certain construction requirements in order to qualify for a new or modified NWP would successfully do so and obtain authorization under that NWP.

2.1 METHODOLOGY

An iterative methodology was used to estimate the effects of the replacement package provisions on Section 404 permitting. The provisions considered in turn include: 1) the activity restrictions and impact limits for the new and modified NWPs, and; 2) the prohibitions imposed by General condition 25 (designated critical resource waters) and General Condition 26 (fills within 100-year floodplains). This is briefly reviewed below and discussed in more detail in Appendix B.

2.1.1 NWP 26 Activities

The flow chart in Figure 2.1a illustrates the iterative screening process used to examine how the replacement package provisions considered here would affect permitting for activities authorized under NWP 26 in FY 98. Each NWP 26 authorization was classified into one of fourteen activity categories. These categories were used to determine which of the new and modified NWPs would accommodate each authorized activity. For each authorization, the activity restrictions and impact limits for the relevant new or modified NWP were first used to determine whether that authorization would qualify for the NWP, or instead require a SP.

Some NWP 26 activities may qualify for NWP authorization under the new NWP 39 (Residential, Commercial, and Institutional Developments). The following NWP 26 activities were counted as NWP 39 activities: institutional, retail individual, retail multiple, residential multiple, industrial, single unit housing, and parking lots. NWP 39 has a 1/2-acre limit, as well as a 300 linear foot limit for excavating and filling streambeds. Agricultural activities authorized by NWP 26 may qualify for authorization under the modified NWP 40. Mining activities, including aggregate mining activities, that were authorized by

[3] Data for the Charleston and Honolulu Districts were not available at the time of the study, and New England District does not utilize NWPs. Thus, these districts were not included in the analysis.

NWP 26 may be authorized by NWP 44. NWP 43 may authorize the construction of stormwater management facilities that were previously authorized by NWP 26. Recreational facilities that were authorized by NWP 26 may be authorized by NWP 42. These NWPs also have a 1/2-acre limit, and NWPs 40, 42 and 43 have a 300 linear foot limit for excavating and filling streambeds.

After estimating which NWP 26 authorizations would shift to SP as a result of the 1/2-acre and 300 linear foot limits, and which NWP 26 authorizations would shift to one of the new or modified replacement NWPs, General Condition 25 (GC 25) and General Condition 26 (GC 26) were imposed on the remaining NWP activities. These are considered in turn below.

GC 25 prohibits the use of 14 NWPs to authorize discharges of dredged or fill material into designated critical resource waters and wetlands adjacent to those waters. Critical resource waters are defined to include: NOAA-designated marine sanctuaries, National Estuarine Research Reserves, National Wild and Scenic Rivers, critical habitat for Federally listed endangered and threatened species, coral reefs, and State natural heritage sites. Critical resource waters also include outstanding national resource waters or other waters officially designated by a State as having particular environmental or ecological significance.

To estimate the number of NWP 26 activities that would be affected by GC 25, it was assumed that 1% of all waters of the United States represent designated critical resource waters, and a corresponding share of all FY 98 NWP 26 activities were located within these waters. This estimate was based on a review of available data on the different categories of critical resource waters and their potential intersection with activities authorized under the affected NWPs (see Appendix B).

Figure 2.1a
Permitting Changes Involving FY 1998
Activities Authorized By NWP 26

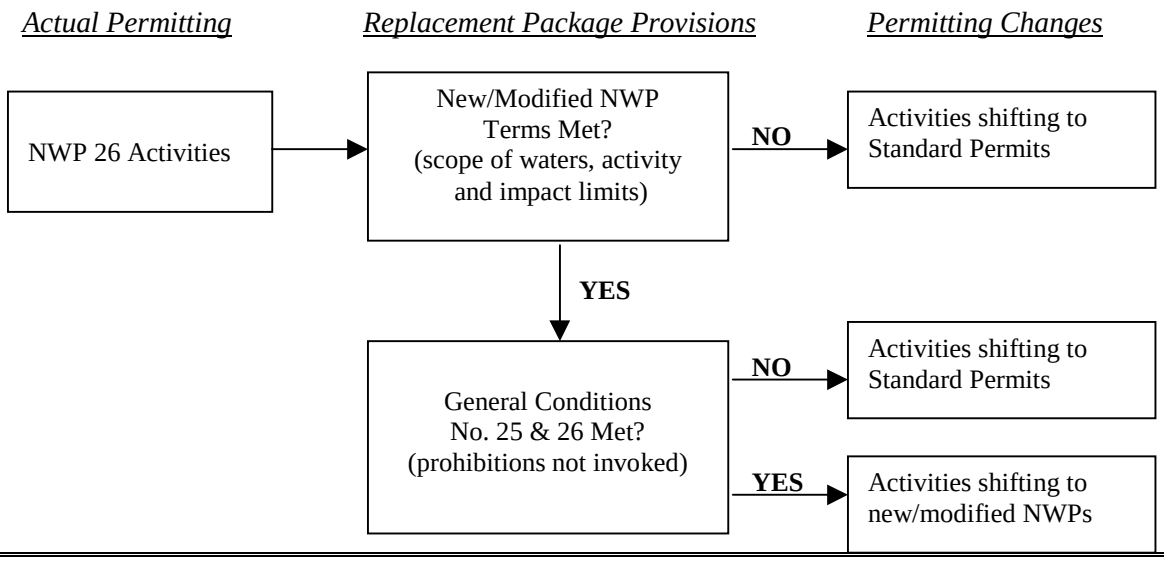


Figure 2.1b
Permitting Changes Involving FY 1998 Activities
Authorized by NWPs Modified by Replacement Package
(NWPs 3, 7, 12, 14, 27, and 40)

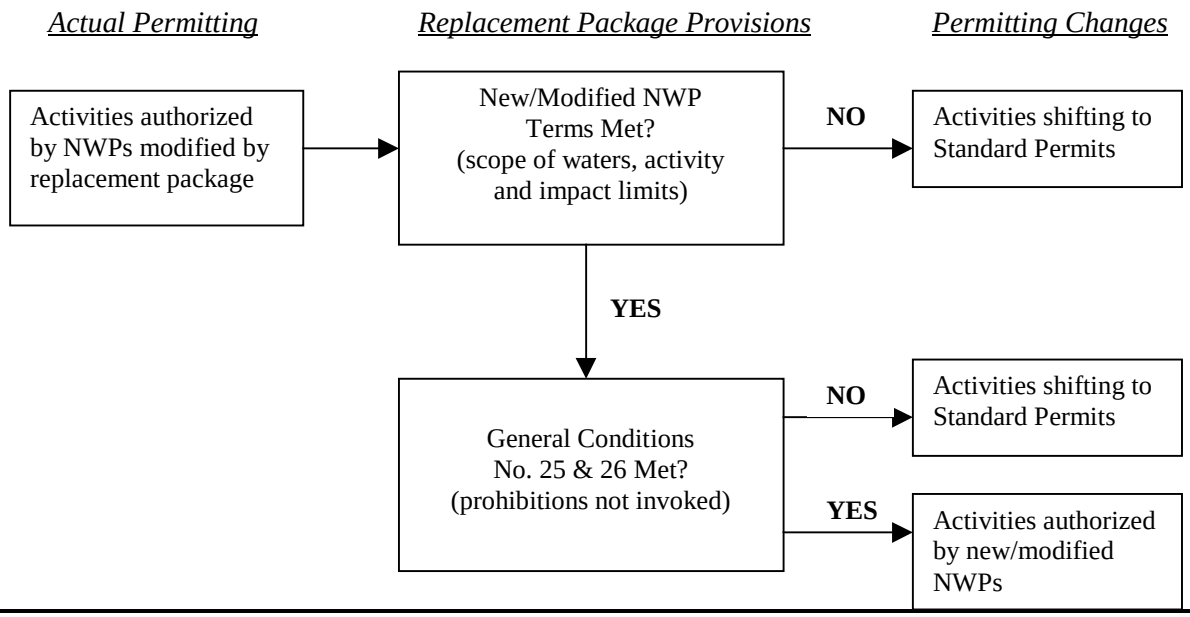
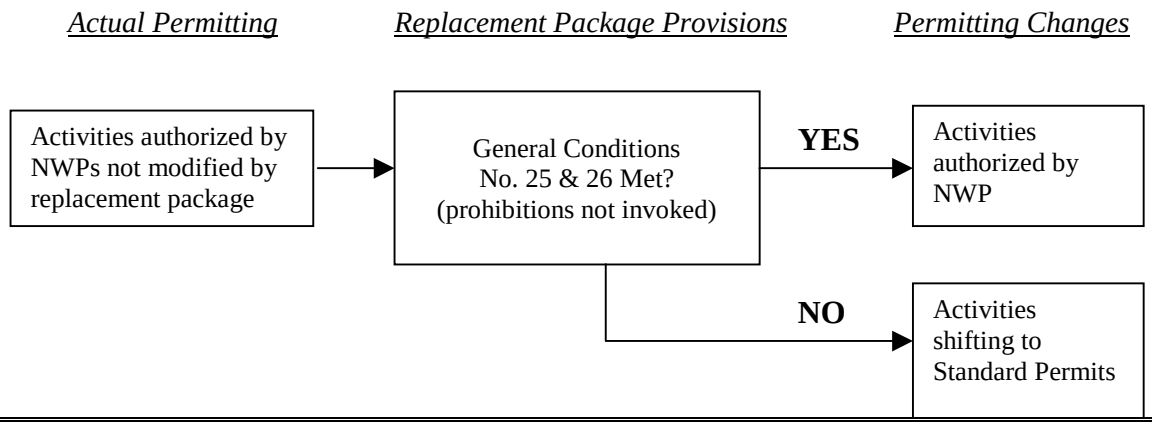


Figure 2.1c
Permitting Changes Involving FY 1998 Activities
Authorized By Other NWPs



GC 26 restricts the use of certain NWPs to authorize discharges of dredged or fill material into waters of the United States within 100-year floodplains identified through the Federal Emergency Management Agency's (FEMA's) Flood Insurance Rate Maps or FEMA-approved local floodplain maps. Activities located *below* headwaters in mapped floodplains are prohibited from using the affected NWPs and must instead obtain SP authorization. Activities located *in* headwaters in mapped floodplains are also prohibited from using the affected NWPs if they occur in the designated *floodway*, defined as that part of the floodplain that carries most of the water during a 100-year storm event.

Assessment of the effects of the GC 26 prohibitions on NWP 26 activities relied on various data and assumptions on the amount of wetlands located in floodplains and total land area of floodplains and their floodways. This analysis found that mapped 100-year floodplains contain roughly 28% of all inland wetlands, and designated floodways less than 2% (see Appendix B). It was then assumed that corresponding shares of activities reported to occur below and in headwaters, respectively, would be required to obtain SP authorization as a result of the GC 26 prohibitions on NWP authorizations in mapped 100-year floodplains.

2.1.2 Other NWP Activities

The permitting change analysis also estimated the extent to which activities authorized in FY 98 under each modified NWP (NWPs 3, 7, 12, 14, 27, and 40) and a category of other existing NWPs would be affected by the replacement package. For purposes of this analysis, NWP 29 was also treated as a modified NWP since its impact limit was reduced from 1/2 to 1/4 acre during the period when the new and modified NWPs were being developed to replace NWP 26.[4] Permit shifts for activities authorized by the modified NWPs were calculated in the same fashion as NWP 26 activities. That is, shifts due to acreage and linear foot impact limits were applied to the activities authorized in FY 1998, and then the shifting factors for general conditions 25 and 26 were imposed on the remaining NWP activities.

2.1.3 Unreported Activities

The modeling of permitting changes outlined above relied on RAMS data on FY 98 NWP 26 activities for which a PCN was submitted to the Corps. It is important to recognize that this data does not include potential other NWP 26 activities that were not reported to the Corps because they involved impacts that were below the reporting threshold. The omission of unreported activities from the permitting change analysis is important to the extent that some of these would now incur regulatory costs under the replacement package. The reporting threshold for NWP 26 defined in terms of impact size was 1/3 acre, while the new threshold for the set of replacement permits is 1/10 acre. Therefore, any activities involving impacts between 1/10 and 1/3 acre that did not report to the Corps in FY 98 would now be subject to reporting requirements.

For this study it was assumed that there would be no previously unreported NWP 26 activities that would newly submit a PCN or SP application and thus incur regulatory costs as a result of the replacement package. This is based on the hypothesis that members of the regulated community can be divided into two groups. One group includes entities that never report to the Corps and incur regulatory costs. Members of this non-reporting group are assumed to be either unaware or unaffected by Section 404 regulations, and thus would not be expected to incur any regulatory costs as a result of the replacement package.

The other group includes entities that always report to the Corps when their activities possibly intersect with jurisdictional waters, even if they involve impacts that fall below the reporting threshold. Evidence

[4] See 64 *Federal Register* 47175; August 30,1999.

for such "over-compliance" comes from the RAMS data used for this study, which suggests that nearly 75% of the NWP 26 activities that were reported to the Corps in FY 98 involved impacts to jurisdictional waters that were less that the 1/3-acre reporting threshold. Members of this reporting group likely include land developers and others whose business activities often require permit authorization under the Section 404 program. These entities might be expected to seek permit authorization even when not technically required to do so in order to eliminate uncertainty created by regulatory ambiguity. Many elements of the Section 404 program are not regulatory "bright lines" that make it straightforward to determine exactly what is and what is not required or authorized. For example, determining whether affected waters are in headwaters, whether a project will impact more than 1/3 acre of waters of the US, or even whether affected waters are jurisdictional under the Corps regulatory program can all be clouded by uncertainty. Members of the reporting group are likely risk-averse and willing to buy insurance against such regulatory uncertainty (i.e., a verification letter from the Corps). The price of that insurance is the cost of submitting a PCN. But the replacement package would not subject this segment of the regulated community to any added regulatory costs to the extent that all of their activities in jurisdictional waters were previously already being reported to the Corps.

2.2. ESTIMATED PERMITTING EFFECTS

Table 2.1 presents the results of the permitting change analysis for FY 98 activities authorized under NWP 26 and other nationwide permits in the 35 districts for which data were available. The replacement package is estimated to result in 2,506 added standard permit applications annually, and an equal number of fewer NWP authorizations. Approximately 87% of the estimated shifts from NWP to SP are due to the activity restrictions and impact limits of the replacement permits. The remaining shifts are due to the prohibition on some fills within the 100-year floodplain imposed by General Condition 26 (8% of total shifts), and on discharges in designated critical resource waters imposed by General Condition 25 (5% of total shifts).

2.2.1 NWP 26 Activities

Of the 6,295 reported NWP 26 authorizations in FY 98, about 4,186 (66%) would be expected to qualify for one of the new and modified NWPs, and the remaining 2,109 would be expected to shift to SP under the replacement package.

2.2.2 Other NWP Activities

Over 98% of the 23,181 reported activities authorized in FY 98 under other NWPs would still qualify for a NWP under the replacement package. An estimated 397 of these activities would now require SP authorization under the replacement package, and all but seven of these were authorized under NWP 12, 14, and 29 in FY 98 (see Appendix B for details).

Table 2.1 Estimated Permitting Changes for FY 98 NWP Activities

FY 98 NWP Activities	**Number of Activities**	**Number shifting to SP**	**Number remaining as NWP**
1. NWP 26 Activities – Applicable New/Modified NWP			
Cleanout – NWP 3	393	11	382
Utility facilities – NWP 12	105	17	88
Transportation – NWP 14	1,007	152	855
Wildlife habitat – NWP 27	87	0	87
Institutional, retail, residential, industrial and parking lots – NWP 39	2,847	923	1,924
Agricultural – NWP 40	504	146	358
Recreational – NWP 42	179	47	132
Stormwater management – NWP 43	362	76	286
Aggregates & other Mining – NWP 44	106	32	74
Silvilculture – None	12	12	0
Treatment facilities – None	70	70	0
Impoundments – None	279	279	0
Erosion control - None	152	152	0
Ponds, dams & miscellaneous – None	192	192	0
Total NWP 26 Activities	6,295	2,109	4,186
2. Other NWP Activities			
NWP 12	3,731	224	3,507
NWP 14	3,095	60	3,035
NWP 21	65	1	64
NWP 27	651	0	651
NWP 29	236	105	131
Others	15,403	7	15,396
Total Other NWP Activities	23,181	397	22,784
Total FY 98 NWP Activities	**29,476**	**2,506**	**26,970**

3. ESTIMATION OF COSTS

3.1 COMPLIANCE COSTS

3.1.1 Direct Costs

Direct compliance costs reflect the out-of-pocket expenses necessary to complete permit applications and comply with permit conditions, including required compensatory mitigation. The analysis of incremental direct costs corresponding to permitting changes focused on estimating the differences in unit compliance costs among affected permits. This required characterizing costs for activities authorized under different permit types. This was accomplished using data and information obtained through informal interviews with wetland permitting consultants and Corps district regulatory staff based around the country.

Table 3.1 identifies the major requirements and associated direct costs for different permit types, developed based on what was learned from the interviews conducted for this study. Specifically, it outlines permit requirements and costs for a NWP 26 PCN and a SP application for a "typical" project affecting up to three acres of waters of the US. The last row of the table presents estimated total direct costs for each permit type. These permit-specific costs were used to estimate changes in unit costs corresponding to the estimated permitting changes.

Table 3.2 presents the estimates of incremental direct compliance costs for the permitting changes estimated for this analysis. Two considerations affect these estimates. The first relates to miscellaneous new procedural requirements imposed by certain replacement permits and general conditions. These new procedures would likely increase costs somewhat for a typical NWP PCN.[5] However, assessment of the total compliance costs they would impose is complicated by the difficulty in identifying affected activities. Further, in aggregate these added costs likely would be much less than the costs associated with activities moving to SP. For these reasons, these added procedural costs were not estimated for this analysis. The study instead proceeded under the assumption that unit direct costs for new and modified NWPs equal the estimated costs for a typical NWP 26 PCN, as reported in Table 3.1.

The second consideration relates to the costs of implementing compensatory mitigation required by permit conditions. The cost analysis proceeded under the assumption that the replacement package would not impose mitigation requirements and costs beyond those that were already imposed by the Section 404 program prior to issuance of the replacement package. This assumption seems reasonable in the case of previously reported NWP activities, for which the Corps has been emphasizing mitigation since 1996, and which account for the majority of estimated shifts from NWP to SP resulting from the replacement package. Nevertheless, the replacement package imposes at least some new mitigation requirements and costs for activities previously authorized under NWP 26 as well as other nationwide permits. The incremental direct compliance costs reported in Table 3.2 that were used to calculate costs corresponding to estimated permit shifts thus do not fully account for all relevant direct compliance that would be imposed by the replacement package.

[5] For example, General Condition 9 (water quality) requires the development of water quality management plans for activities authorized under the set of replacement permits.

Table 3.1 Estimated Direct Compliance Costs by Permit Type (Excluding costs to implement compensatory mitigation)

Application Component	NWP 26 PCN (Impacts up to 3 acres)	SP Application (Impacts up to 3 acres)
Delineation and survey of special aquatic sites	$2,000-3,000 for a 10-20 acre project site. Cost depends on project area and the total length of impact areas. Engineering survey of impact areas (if required) would impose added costs	$2,000-3,000 for a 10-20 acre project site. Cost depends on project site area and length of impact areas. Engineering survey of impact areas (if required) would impose added costs
Project/Impact Drawings	$500-3,000 for detailed plan views and cross sections (Cost depends on number of separate impact areas)	$2,000-3,000 for detailed plan views and cross sections (Cost depends on number of separate impact areas)
Alternatives Analysis	Discussion of on-site alternatives, e.g. site layout designs and engineering opportunities to avoid and minimize impacts	$3,000 and up for on- and off-site alternatives analysis. Cost can go much higher ($50,000 or more) in the case of controversial projects
Mitigation Proposal	$3,000-4,000 for conceptual on-site mitigation plan if requirement can not otherwise be met with measures that do not require design plans	$3,000-4,000 for conceptual on-site mitigation plan if other mitigation options (e.g. in lieu fee or banking) are not available or allowable
Application Submission	$1,000-4,000 to complete application that includes all notification requirements	$2,000-6,000 to complete application that includes all requirements
Total Permit Cost for a Typical Project	**$3,000 – $10,000**	**$12,000 – $24,000**

Table 3.2 Estimated Incremental Direct Compliance Costs Corresponding to Permitting Changes

Permitting Change	Change in Unit Compliance Cost	Basis for Unit Change in Direct Compliance Cost
NWP (PCN) activity shifting to new/modified NWP or remaining as unmodified NWP	**Assume no change** (Not estimated)	The new and modified NWPs and General Conditions will impose miscellaneous new procedural requirements that likely will increase average PCN costs somewhat. These added costs were not estimated; instead, the cost analysis assumes that NWP PCN costs under the replacement package will mirror those for a NWP 26 PCN as reported in Table 3.1
NWP (PCN) activity shifting to SP	**+ $11,500**	Difference between the midpoint of the range for SP application costs, and the midpoint of the range of NWP 26 PCN costs, as reported in Table 3.1.

3.1.2 Indirect Costs

The indirect costs of compliance with the Section 404 program largely represent "opportunity costs" that are not necessarily reflected in out-of-pocket expenses. Opportunity costs include permitting time costs and any development values foregone as a result of the Corps application of the Section 404(b)(1) "sequencing" rules. The sequencing rules, which require permit applicants to take all practicable steps to avoid, minimize and mitigate impacts, are often used to require permit applicants to re-design projects and reserve portions of project sites for compensatory mitigation. Such mandated project alterations can reduce potential development value.

The replacement package would be expected to increase the indirect costs of permitting, and these added costs could potentially be more significant than the incremental direct costs. While the importance of incremental indirect costs is recognized, estimation of these costs is complicated by, among other things, the extreme variability in the types and characteristics of potentially affected activities and the economic settings in which they occur, and the many ways in which indirect costs can be manifested. The data and level of analysis needed to adequately assess these costs are beyond the time and resources available for this study.

As a second best approach, the analysis presented below developed two partial measures of indirect costs that might be imposed on the regulated community by the replacement package. First, a permitting time analysis was used to predict the extent to which permit application processing times and backlogs might increase as a result of the replacement package. Second, an illustrative estimate of foregone development value resulting from the new vegetative buffer requirement was developed for the residential development sector.

3.1.2.1 Increased Permitting Time

Permitting time can be defined as the total amount of time it takes for project sponsors to apply for and obtain Corps permit decisions. Permitting time for any applicant can be categorized into three parts:

1. The time it takes the applicant to prepare the application and submit it to the Corps,
2. The time it takes the applicant to respond to any Corps requests for additional project information needed to complete the application, and;
3. The time it takes the Corps to evaluate and reach a final decision on the completed application.

The replacement package would likely increase each component of permitting time for those activities that are directly affected (e.g., activities previously authorized under NWP 26).[6] Perhaps more importantly, the replacement package would also likely produce systemic effects on Section 404 permitting with respect to the third component of permitting time identified above. That is, the increased permitting workload resulting from the replacement package would be expected to increase the average time it takes the Corps to process any permit application, including those that would not otherwise be affected by the replacement package. The analysis of increased permitting time resulting from the replacement package focused on estimating such systemic effects on the Corps processing of SP applications.[7]

[6] This is particularly true for NWP activities that under the replacement package would need to obtain standard permit authorization. For example, in FY 98 it took the Corps an average of 89 days to process a standard permit application, but only 18 days to process a NWP application. Factors contributing to the longer processing time for standard permits include the need to perform an off-site alternatives analysis, issue a public notice and consider public comments, and coordinate with Federal and state resource agencies.

[7] The permitting time analysis used FY 98 data on activities authorized under standard permits and "letters of permission" combined, since some of the relevant data elements are only available at this level of aggregation. A

The permitting time analysis proceeded under several operational assumptions. First, it was assumed that Corps district regulatory branches are currently operating at full capacity. In other words, at current funding levels the Corps districts could not process significantly more permits than they currently do without compromising permitting oversight. Second, it was assumed that Corps district regulatory budgets would remain roughly at current levels. Third, it was assumed that Corps districts would not cut corners in permitting oversight in an effort to absorb the increased workload within current budget limits.

Together, these assumptions imply that the number of SP applications processed (i.e., issued or denied) nationally over each of the next several years would remain roughly at levels experienced prior to issuance of the replacement package. This in turn suggests that the main effect of the replacement package on the Corps processing of SP applications would be to: 1) increase the average amount of time it takes the Corps to process a permit application, and 2) increase the number of applications awaiting processing, that is, increase in carryover from year-to-year.

These two indicators of permitting time were predicted for each of the five years in which the replacement package would be in effect. Processing time is represented by a measure of "average evaluation days" per processed application that the Corps routinely calculates each year for major permit types based on the total permitting workload during that year. Increase in pending SP applications is represented by the estimated number of pending applications at the end of each year that would be carried forward into the permitting queue for the next year.

To predict average processing time under the replacement package, the following relationship between processing time and the number of permit applications was postulated:

(1) Average Evaluation Days = f (Carryover, Received, Withdrawn, Processed)

Where: Average Evaluation Days = Average number of days it takes the Corps to process a permit application in the current year
Carryover = Number of permit applications not finalized (pending) at the end of the previous year and carried forward into the current year
Received = Number of permit applications received in the current year
Withdrawn = Number of permit applications withdrawn in the current year
Processed = Number of permit applications issued or denied in the current year.

Equation (1) says that the average processing time for a permit application in some year (dependent variable) is determined by the number of permit applications moving through the system in that year (independent variables). The careful reader will note that the other permit application variable of interest here—the number pending at the end of the current year, can be derived by combining the independent variables in equation (1).[8] Given this identity, equation (1) can be reduced to:

(2) Average Evaluation Days = f (Pending)

Where: Average Evaluation Days = Average number of days it takes the Corps to process a permit application in the current year
Pending = Number of applications pending at the end of the current year that are carried forward into the next year.

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letter of permission is an abbreviated standard permit that is sometimes available for non-controversial projects involving minor impacts.

[8] Applications pending at the end of the current year = (pending applications carried over from the previous year) + (applications received in the current year) – (applications withdrawn in the current year) – (applications processed in the current year).

The relationship specified by equation (2) was used together with FY 98 values for the dependent and independent variables to calculate a parameter that identifies the relationship between these variables in FY 98.[9] This parameter was then used to predict average evaluation days (AED) in each of the five years following implementation of the replacement package.

Since the prediction of AED in any year using equation (2) depends on the number of pending applications at the end of that year, this latter variable had to be estimated first. This was accomplished by combining the actual or estimated values for the permit application variables given in the right-hand side of equation (1).

For example, calculation of the number of pending applications at the end of year 1 under the replacement package proceeded as follows. First, the number of pending applications at the end of FY 98 was obtained from the RAMS database. This provided an estimate of the number of applications carried forward into year 1. The number of received applications in year 1 was then calculated as the number of received applications in FY 98 (from RAMS) plus the additional applications estimated to result from the replacement package (from the permitting change analysis). This estimate of received applications was then summed with carryover applications to calculate the total number of applications in the permitting queue in year 1. It was then necessary to subtract from this total the estimated number of applications that would be processed and withdrawn, respectively, during the year. Since it was assumed that the number of applications processed annually under the replacement package would remain at current levels, the number of processed applications in FY 98 (from RAMS) was used to represent the number processed in year 1. Two alternative assumptions, explained below, were used to estimate the number of withdrawn applications during the year.

This procedure provided an estimate for the number of pending applications at the end of year 1 that also represents carryover applications in year 2. The procedure was repeated for each of years 2-5 to calculate the number of pending applications at the end of each of those years. These estimates were then multiplied by the parameter derived from equation (2) to predict AED for years 1-5.

The results of the permitting time analysis are presented in Tables 3.3a and 3.3b. The tables provide alternative sets of predictions for AED and end-of-year pending applications for years 1-5 under the replacement package. The two sets of predictions differ due to their reliance on different scenarios for estimating the number of withdrawn applications in each year, as explained below.

The Scenario 1 predictions in Table 3.3a were calculated using estimates for the number of withdrawn applications in each year based on the ratio of the number of withdrawn applications in FY 98 to the number of received applications in FY 98. This ratio, when multiplied by the estimated number of received applications in any year 1-5, provides an estimate of the number of withdrawn applications in that year. Since the estimated number of received applications is constant across years 1-5, the estimated number of withdrawn applications is also constant across these years.

The Scenario 2 predictions in Table 3.3b were alternatively calculated using estimates for the number of withdrawn applications in years 1-5 based on the ratio of withdrawn applications in FY 98 to the sum of carryover applications and received applications in FY 98. In this scenario, the estimated number of withdrawn applications steadily increases over years 1-5 since the estimates for carryover applications increase over these years. In essence, this scenario assumes that increasing numbers of permit applicants

[9] Equation (2) is specified as $Y = BX$, where Y is average evaluation days in FY 98, X is the number of pending applications at end of FY 98, and B is an unknown parameter. Plugging in actual FY 98 values for X and Y and solving for B yields a factor defining the relationship between X and Y in FY 98.

would withdraw from the permitting process each year as permit processing times and numbers of pending permit applications rise.

Table 3.3a. Predicted Processing Time and Increase in Pending Standard Permit Applications: Scenario 1*

Standard Permit Applications	FY 98 (Actual)	Year 1	Year 2	Year 3	Year 4	Year 5
Carryover – unprocessed applications from previous year	3,866	3,972	5,519	7,066	8,613	10,160
Received – applications received in current year	9,036	11,542	11,542	11,542	11,542	11,542
Withdrawn – applications withdrawn in current year	3,841	4,906	4,906	4,906	4,906	4,906
Processed – applications issued or denied in current year	5,089	5,089	5,089	5,089	5,089	5,089
Pending – applications carried forward into next year	3,972	**5,519**	**7,066**	**8,613**	**10,160**	**11,707**
Average Evaluation Days Per Processed Application	89	**121**	**155**	**189**	**224**	**258**

* Scenario 1 relies on estimates for the number of withdrawn applications in years 1-5 based on the ratio of withdrawn application in FY 98 to received applications in FY 98. See text for explanation.

Table 3.3b. Predicted Processing Time and Increase in Pending Standard Permit Applications: Scenario 2*

Standard Permit Applications	FY 98 (Actual)	Year 1	Year 2	Year 3	Year 4	Year 5
Carryover – unprocessed applications from the previous year	3,866	3,972	5,806	7,095	8,000	8,635
Received – applications received in current year	9,036	11,542	11,542	11,542	11,542	11,542
Withdrawn – applications withdrawn in current year	3,841	4,619	5,164	5,548	5,818	6,007
Processed – applications issued or denied in current year	5,089	5,089	5,089	5,089	5,089	5,089
Pending – applications carried forward into next year	3,972	**5,806**	**7,095**	**8,000**	**8,635**	**9,081**
Average Evaluation Days Per Processed Application	89	**128**	**156**	**176**	**190**	**200**

* Scenario 2 relies on estimates for the number of withdrawn applications in years 1-5 based on the ratio of withdrawn applications in FY 98 to the sum of carryover applications and received applications in FY 98. See text for explanation.

The Scenario 1 predictions indicate that permit application processing times and pending permit applications carried over into the next year would be more than double FY 98 levels by the third year following implementation of the replacement package. In year 5, processing times and pending applications are predicted to reach almost three times the levels experienced in FY 98.

The Scenario 2 predictions are roughly the same as those predicted by Scenario 1 for the third year under the replacement package. However, the Scenario 2 predictions of processing times and increased applications pending for year five are significantly less than those estimated for year five under Scenario 1. This is because Scenario 2 assumes that increasing numbers of permit applicants would withdraw from the permitting process as processing delays increase over years 1-5.

Opportunity costs associated with the predicted increases in permit processing time could not be assessed in dollar terms for this study, due largely to the wide array of factors that can affect time costs within and across different categories of affected activities. (Box 1 provides an overview of factors affecting one way in which increased permitting time can impose opportunity costs on land development activities). While the opportunity costs of permitting delay could not be assessed, they could potentially be the most significant element of compliance costs resulting from the replacement package. The level of increased permitting time and associated costs resulting from the replacement package will depend largely on the amount of resources available to the Corps for processing permits. The estimates of increased permitting time generated above are based on the assumption that Corps districts' annual permitting budgets would remain roughly at FY 98 levels.

3.1.2.2 Foregone Development Value

Activities previously authorized under NWP 26 and other NWPs were already required to avoid, minimize, and mitigate adverse impacts at project sites under the NWP program prior to issuance of the replacement package. The opportunity costs of such mandated project modifications thus might not be expected to increase substantially as a result of the replacement package. However, the replacement package includes a new emphasis on requiring vegetated buffer zones adjacent to open waters located at project sites as a means to prevent more than minimal degradation of aquatic habitat and water quality. This new requirement would be expected to increase the loss of development value associated with affected activities.

The buffer provision is part of modified General Condition 19 (Mitigation) that applies to all nationwide permit authorizations requiring a PCN.[10] The condition says:

> "An important element of any compensatory mitigation plan for projects in or near streams or open waters is the establishment and maintenance, to the maximum extent practicable, of vegetative buffers next to open waters on the project site… The District Engineer will determine the appropriate width of the vegetative buffer and in which cases it will be required. Normally, the vegetative buffer will be 25 to 50 feet wide on either side of the stream…" (65 Federal Register 12896; March 9, 2000).

The buffer provision could result in the loss of potential development value of affected projects by reducing the total land area available for development use. Depending on the number and configuration of waters (including intermittent streams) located on some project site, establishment of buffers to the fullest extent could significantly diminish the area of the site that is available for development.[11]

[10] The vegetative buffer requirement is also included directly in the new NWP 39 (Residential, Commercial, and Institutional Developments) as a criterion for activities authorized under this permit.

[11] Perhaps in recognition of this potential for economic loss, General Condition 19 gives District Engineers full discretion on when and to what extent to require vegetative buffers. While this flexibility suggests that Corps districts could limit potential economic loss in the application of buffer requirements, it also means that the level of regulatory uncertainty faced by the development community may rise. Case-by-case determination of required buffers could make it more difficult for project sponsors to evaluate potential development projects.

Assessment of the opportunity costs that might result from the vegetative buffer provision requires several pieces of information that are not readily available or estimable. For each type of potentially affected project, the following information would be needed to approximate development value foregone as a result of the buffer requirement:

1. Share of permitted projects required to establish buffers,
2. Land area of affected projects set aside for buffers, and;
3. Development value of affected lands.

The share of permitted projects that would be affected by buffer requirements depends on the extent to which open waters are located on project sites, and the extent to which Corps districts would require buffers for these waters. The land area of affected projects that would be set aside for buffers is a function of the number and configuration of open waters at project sites, and the width of buffer zones for these waters required by Corps regulators.

The extent and level to which Corps regulators would require buffers for open waters found on project sites is of course unknowable. And adequate information is lacking on the total land area at project sites that could potentially be affected by buffer zones along rivers, streams, and other open waters.

Similarly, adequate information is largely unavailable on development values for potentially affected lands. Development values are reflected in the market prices of lots available for development use. However, property values for lands used by any specific type of affected development activity (e.g., shopping centers) can of course vary widely across the country. This limits the usefulness of estimates of average property values to proxy development values foregone for different activity types potentially affected by buffer requirements. At any rate, estimates of national average property values by development sector are not readily available.

The uncertainties and data limitations outlined above, together with the limited time and resources available for this study, prevented a detailed and comprehensive assessment of the magnitude of development values potentially foregone as a result of the vegetative buffer provision. Instead, an illustrative estimate of foregone development value was calculated for residential development activities (see Box 2). Historically, these activities more than any other have relied on NWP 26 for permit authorization, and thus could be the most affected by buffer requirements. The analysis presented in Box 2 suggests that the vegetative buffer provision could impose annual opportunity costs of roughly $5 million on this one sector alone (which accounts for approximately 20% of FY 98 NWP 26 PCN activities that would still qualify for NWP authorization under the replacement package).

3.2 ADMINISTRATIVE COSTS

The Corps incurs administrative costs to process each PCN or SP application received. These costs vary by the type of permit sought as well as the complexity and scope of the proposed activity. All other factors being equal, the replacement package would affect the Corps administrative costs by changing the total number and mix of permit applications received. To estimate the net effect of the replacement package on administrative costs (while holding constant the current level of Section 404 program efficiency and oversight) the following relationship between a Corps district's annual permitting budget and the number of each permit type processed in the district was postulated:

(3) Annual Permitting Budget = *f* (SP/LOP, NWP, RGP, REC)

Where: Annual Permitting Budget = 76.4% of FY 98 Regulatory Branch Obligations[12]
SP/LOP = Number of Standard Permits and Letters of Permission authorized in FY 98
NWP = Number of Nationwide Permits authorized in FY 98
RGP = Number of Regional General Permits authorized in FY 98
REC = Number of Standard Permit and Letters of Permission applications *received* in FY 98.

Equation (3) was estimated with ordinary least squares using FY 98 budget and permitting data from 37 districts. [13] The estimated coefficients for the first three independent variables can be interpreted as the average budgetary allotment spent per permit processed (issued or denied) for each permit type. These estimates were used to proxy the average administrative cost of processing each type of permit. The average Corps costs to process a SP/LOP application and a NWP PCN were estimated to be $1,492 and $389, respectively.

The final independent variable posits that SP/LOP applications impose administrative costs when they are received as well as when they are processed. This recognizes that all SP applications received impose administrative costs on the Corps even if they are eventually withdrawn and therefore never processed. The estimated coefficient for the REC variable can be interpreted as the unit Corps costs for receiving and establishing a file for a SP/LOP application, apart from the cost to process (issue or deny) the permit request.[14] The sum of estimated coefficients for the SP/LOP and REC variables represent the total cost of receiving and processing an individual permit applications. This sum is estimated as $2,568 per application that is both received and processed.

The estimated equation also included a dummy variable indicating whether a district issued less NWPs than other permit types in FY 98. This variable posits that such districts face different levels of fixed costs for administering the permit program. The estimated coefficient for this variable indicates that districts that rely more heavily on permit types other than NWPs require about $1.2 million more in annual permitting budget.

The estimated coefficients were used together with the results of the permitting change analysis to estimate the increase in the Corps annual permitting budget that would be needed to maintain current levels of permitting efficiency. For example, the number of activities predicted to shift from a nationwide permit to a standard permit was multiplied by $2,180, the difference in the sum of the estimated coefficients for the SP/LOP and REC variables, and the estimated coefficient for the NWP variable. This provides an estimate of added variable administrative costs under the replacement package. To estimate fixed administrative costs, the district-level results of the permitting change analysis were used to identify how many more districts would process other permit types more often than NWPs under the replacement package. This result was then multiplied by the estimated coefficient for the dummy variable to estimate fixed administrative costs. Total Corps administrative costs were calculated by summing estimated variable and fixed costs.

[12] Total regulatory branch budgetary obligations in FY 98 for all Corps districts were $104.8 million, of which approximately $80.1 million (76.4%) were for permitting. (Source: Frank Torbett, Corps Headquarters)
[13] Data from the Alaska District were viewed as atypical and thus were excluded from the analysis. The specification of equation (3) and the full set of regression results are presented in Appendix C.
[14] In the previous cost analysis for the 1999 proposal to issue and modify nationwide permits, the specification of equation (3) did not include a separate variable to represent the cost of receiving an individual permit (SP or LOP) distinct from the cost of processing an individual permit. Consequently, the permit-specific administrative costs reported here differ somewhat from those estimated in that previous analysis.

Box 1: Opportunity Costs of Increased Permitting Time: Conceptual Overview

The opportunity costs to permit applicants of an increase in the time it takes the Corps to process Section 404 permit applications can be manifested in a variety of ways. For land development activities (e.g., residential subdivisions, shopping centers), some of the ways in which the opportunity costs of project delay are incurred depend largely on whether the permit applicant owns the land on which the activity would be located. A brief look at land-related factors that could impose opportunity costs on residential land development activities follows below.

Case 1: Permit Applicant Does Not Own the Project Site

At the time at which they enter the permitting process, some applicants for Section 404 permits do not own the lands on which proposed activities would be located. For example, a project sponsor can obtain an "option" to purchase a prospective project site that extends through the time period required for Section 404 permitting. A real estate option provides the holder with the right (but not the obligation) to purchase a land parcel at a specified price on or before a specified date. The option is sold by the landowner to the potential land buyer at a price agreed upon by both parties.

For a project sponsor who uses a real estate option (or similar contractual arrangement) to secure a prospective project site during the Section 404 permitting process, an increase in permitting time would force the sponsor to obtain an option of a longer duration, at a higher price. In other words, the project sponsor would be forced to pay a premium for the needed option as a result of increased permitting time. Assuming that the project sponsor receives the Section 404 permit within the option period, buys the land, and the option amount is applied to the land purchase price, then the opportunity costs of the increased permitting time are reflected in benefits foregone by not employing the option premium in its most economic alternative use. For example, the project sponsor could have alternatively invested the dollar amount of the option premium in US Treasury securities and earned interest payments during the length of the option period. These foregone interest earnings reflect the opportunity costs of increased permitting time in the case outlined above.

Case 2: Permit Applicant Owns the Project Site

Other project sponsors own the sites for proposed activities at the time at which they enter the Section 404 permitting process. Assuming that a project sponsor in this situation would eventually be issued Section 404 permit authorization, then the opportunity costs of increased permitting time are reflected in the amount of project net returns (profits) foregone by not being able to proceed with the project sooner rather than later.

Other Factors Driving Project Delays

The above explanation of the opportunity costs of permitting time assumes that the amount of time it takes the Corps to process Section 404 permit applications is the limiting factor driving project delays. This may not always be the case, however. For example, local government entities often require the sponsors of land development projects to submit site plans for approval, and this process can take a significant amount of time to complete. If a project sponsor concurrently pursues Section 404 permitting and local government approval of site plans, then an increase in the amount of time it takes the Corps to process the project sponsor's permit application would increase opportunity costs to the project sponsor only to the extent that Section 404 permitting time extends beyond that required for site plan approval.

Box 2: Illustrative Estimate of Residential Development Value Foregone Due to Vegetative Buffer Requirements (NWP 39 and General Condition 19)

Estimated Number of Affected Activities

The permitting change analysis estimated that each year a total of 847 activities classified as "residential multiple" would seek and receive Section 404 authorization under the new NWP 39. Assuming that the Corps would require vegetative buffers primarily for NWP activities that occur in floodplains, then about 414 of these activities (49%) would be subject to buffer requirements. These represent the estimated share of residential development activities in 100-year floodplains located above headwaters that are not prohibited by General Condition 26, as calculated based on the assumptions used in the permitting change analysis.

Estimated Land Area Affected

For this analysis, the average land area for activities classified as residential multiple is assumed to be 10 acres. The assumed share of project areas that would be devoted to buffers is based on a published source which asserts that in most regions of the country a 100-foot wide buffer on each side of headwater streams would take about 5% of the total land area in any given watershed out of development use (Schueler, 1995). Scaling this estimate to the 25-50 foot buffer requirement imposed by the replacement package implies that approximately 2% of the total land area of affected residential development activities would be set aside for buffers.

Total affected land area is calculated by combining the estimates for the number of affected activities, average project area, and the share of project areas devoted to buffers. This yields an estimated 83 acres of residential development lands that would be left undeveloped due to buffer requirements.

Estimated Development Value Foregone

A publication of the National Association of Homebuilders (1998) says that the national average cost for a 7,500-10,000 square foot raw lot for single-family homes is about $30,000. Assuming that one acre of land can accommodate three such lots, then the per acre value of unimproved residential development land is roughly $90,000.

Applying this unit land value to the estimated number of acres set aside for buffers yields an estimated foregone development value for the residential development sector of about $7.5 million annually. Since buffers can be used to satisfy part of a permit applicant's compensatory mitigation requirement, this would reduce (to an unknown extent) the amount of "new" regulatory costs associated with the buffer requirement. Assuming that this reduces the buffer cost by approximately one-third, then the total net costs of required buffers for residential development activities would be roughly $5 million per year. This is approximately 1.3 % of the overall cost of the land to developers, which is estimated at $375 million. The $5 million estimate is highly speculative based on the series of assumptions. Further, the $5 million estimate is based on the assumption that the buffer requirement does not duplicate pre-existing other Federal, state, or local buffer requirements and thus represents added regulatory costs to wetland developers. The extent to which other programs have buffer requirements reduces the estimated costs to wetland developers.

Tom Schueler. 1995. "The architecture of stream buffers". *Watershed protection techniques*. Vol.1, No.4 (Summer).
National Association of Homebuilders. 1998. *The truth about regulatory barriers to housing affordability*.

4. SUMMARY OF FINDINGS

4.1 PERMITTING CHANGES

The replacement package is estimated to result in 2,506 added standard permit (SP) applications annually, and an equal number of fewer nationwide permit (NWP) pre-construction notification (PCN) submissions, as shown in Table 4.1. The new SP applications would increase by more than 25% the number of SP applications received by the Corps in FY 98.

Approximately 87% of the total estimated shifts from NWP to SP are due to the activity restrictions and impact limits imposed by the replacement permits. The remaining shifts are driven by the prohibitions on some above-grade fills within the 100-year floodplain imposed by General Condition 26 (about 8% of total shifts) and on discharges in designated critical resource waters and adjacent wetlands imposed by General Condition 25 (about 5% of total shifts).

Activities previously authorized under NWP 26 account for the majority (85%) of the estimated new SP applications. About one-third of the 6,295 activities that reported to the Corps and were authorized under NWP 26 in FY 98 would require SP authorization under the replacement package.

4.2 COMPLIANCE COSTS

4.2.1 Direct Costs

Permitting changes resulting from the replacement package would increase direct compliance costs by an estimated $29 million annually, as shown in Table 4.1. These direct costs represent the out-of-pocket costs that the regulated community would need to incur to obtain required permit authorizations under the replacement package.

4.2.2 Indirect Costs

The indirect costs of compliance with the Section 404 program represent opportunity costs that are not reflected in out-of-pocket expenses. Two partial measures of indirect costs resulting from the replacement package were estimated. First, an illustrative estimate of development value foregone due to the new vegetative buffer requirement (General Condition 19) was estimated for residential development activities. Using a set of assumptions, this provision is estimated to impose annual opportunity costs of roughly $5 million on this one sector alone. This estimate should be viewed as no more than suggestive of possible opportunity costs resulting from the new buffer requirement, however, since its derivation was based on a number of assumptions that may not accurately reflect the extent to which buffers will actually be required and other relevant variables that can affect buffer costs.

Second, a permitting time analysis was used to predict systemic effects of the replacement package on the Corps processing of standard permit applications, assuming that Corps district permitting budgets would remain roughly at FY 98 levels. The results indicate that the average time it takes the Corps to process any standard permit application, and the level of end-of-year pending (carryover) applications awaiting Corps processing, would rise steadily each year under the replacement package. In the third year after issuance, average SP processing times and applications pending processing are predicted to reach twice their FY 98 levels. In year 5, processing times and applications awaiting processing would increase to 2-3 times the levels experienced in FY 98. While the opportunity costs of increased permitting time could not be assessed in dollar terms, these could be the most significant element of compliance costs resulting

from the replacement package. The extent to which indirect compliance costs may increase will depend largely on the amount of resources available to the Corps for processing permit applications.

Table 4.1 Summary of Estimated Changes in Permitting and Direct Compliance and Administrative Costs

Estimated Permitting Changes Involving Activities Authorized Under NWPs in FY 98	Number of Activities	Unit Direct Compliance Costs	Unit Corps Costs	Total Direct Compliance Costs ($)	Total Corps Costs ($)
FY 98 NWP 26 Activities shifting to:	6,295				
• New/Modified NWP	4,186	0	0	0	0
• Standard Permit	2,109	11,500	2,180	24,253,500	4,597,600
Total Costs, NWP 26 Activities				24,253,500	4,597,600
FY 98 Other NWP Activities remaining as or shifting to:	23,181				
• Unmodified/Modified NWP	22,784	0	0	0	0
• Standard Permit	397	11,500	2,180	4,565,500	865,500
Total Costs, Other NWP Activities				4,565,500	865,500
Total Annual Change in Standard Permits	**+2,506**				
Total Annual Costs of Permitting Changes				**$28.9 Million**	**$6.6 Million***

* In addition to the unit (variable) Corps costs included in the column, this estimate of total Corps cost includes an estimated level of extra fixed costs needed by the Corps to implement the replacement package while maintaining current levels of permitting efficiency. It is based on an estimated additional fixed cost ($1,179,683) needed by each district that processes less NWPs than other types of permits combined (see Section 3.2 and Appendix C). The permitting change analysis predicts that one additional district would be in this situation under the replacement package, indicating that an extra $1,179,683 in total Corps permitting budget would be needed.

4.3 ADMINISTRATIVE COSTS

The estimates of increased permitting times are based on the assumption that Corps district annual permitting budgets would remain roughly at FY 98 levels. The study also estimated the increase in regulatory program permitting budget that the Corps would need to implement the replacement package while maintaining current levels of permitting efficiency. An estimated additional $7 million in Corps regulatory budget would be needed annually, or about 8% more than the Corps spent on permit processing in FY 98.

4.4 DISCUSSION

Several important considerations affecting the permitting and cost analyses should be kept in mind when evaluating the study results outlined above. These are reviewed briefly below.

Two major assumptions affect the estimated permitting changes reported here. The first relates to the possibility that the lower reporting thresholds for replacement permits will increase the set of regulated

activities that will submit a NWP PCN to the Corps and thus incur regulatory costs. The reporting threshold for NWP 26 defined in terms of impact size was 1/3 acre, while the new threshold for the set of replacement permits is 1/10 acre. This suggests that there may be some authorized activities that previously were not reported to the Corps because they involved impacts less than 1/3 acre, but for which reporting would now be required under the replacement permits.

For this study, however, it was assumed that there would be no previously unreported NWP 26 activities that would newly submit a PCN and incur regulatory costs as a result of the replacement package. This is based on the hypothesis that those entities whose activities involve regulated discharges in waters of the United States fall into two broad groups. One group includes entities that never report to the Corps and incur regulatory costs, even if technically required to do so. Members of this group are assumed to be unaware, of or not influenced by, the Section 404 program, and thus would not be expected to incur regulatory costs as a result of the replacement package.

The other group includes entities that always report to the Corps, even when their project impacts fall below the reporting threshold. Evidence for such "over-compliance" comes from the FY 98 permitting data used for this study, which indicates that approximately 75% of reported NWP 26 activities involved impacts that were below the 1/3-acre reporting threshold. In other words, a PCN for these activities was submitted to the Corps even though not required under NWP 26. If all such NWP 26 activities were reported regardless of impact size, then it can be assumed that the lower reporting thresholds required by the replacement permits would not increase the number of activities that incur regulatory costs.

A second assumption that affects the permit change estimates relates to a possible behavioral response by the regulated community. It is likely that, when possible, regulated entities often try to design their activities in order to qualify for NWP authorization and so avoid the more time- and resource-intensive standard permit process. For example, it is generally believed that when the impact limits for NWP 26 were changed from 10 to 3 acres in 1996, the number of standard permit applications did not increase to the extent expected largely because the regulated community adjusted many projects to fit within the new lower limits. Of course, there is much less scope for such adjustments under the replacement permits since they cap NWP impacts at 1/2 acre. The permitting change analysis conducted for this study implicitly assumed no behavioral response on the part of the regulated community.

A number of assumptions and other considerations also affect the interpretation of the study cost estimates. For a number of reasons, the estimates of incremental direct compliance costs reported here should be viewed as conservative (potentially under-estimated). One reason is that the NWP cost estimates do not account for added NWP costs associated with miscellaneous new procedural requirements imposed by the replacement permits and general conditions.[15] Another reason is that the estimates of unit costs for standard permits used to calculate incremental direct compliance costs do not adequately reflect costs for controversial projects. In those cases, costs for the required "off-site alternatives analysis" alone can easily be several times the unit cost estimate for standard permits used for this analysis.

A third reason for viewing the incremental compliance cost estimates as conservative is the lack of accounting for possible new mitigation costs for activities authorized under nationwide permits. The replacement package requires compensatory mitigation at a minimum 1:1 ratio for all wetland impacts requiring a PCN. The compliance cost analysis proceeded under the assumption that the replacement package would not result in mitigation requirements and costs beyond those that were already being imposed by the NWP program. This assumption seems reasonable for NWP 26 activities, for which the

[15] For example, modified General Condition 9 (Water Quality) requires the development of water quality management plans for activities authorized under the set of replacement permits.

Corps has been emphasizing mitigation since 1996. Nevertheless, the replacement package imposes at least some new mitigation requirements and costs for activities previously authorized under NWP 26 as well as other nationwide permits.

As with the study compliance cost estimates, the estimated additional Corps permitting budget needed to maintain current levels of permitting efficiency should be viewed as only a first approximation that may understate actual budget needs. It is based on estimated unit processing costs for different types of permits, and fixed processing costs for different combinations of permit types processed, calculated by specifying and estimating a linear relationship between Corps district permitting budgets and the number and mix of permits processed in FY 98. The results of this type of analysis are sensitive to how the relationship is specified and estimated. And it must be kept in mind that these estimates of permit processing costs are based on current permitting levels, and are thus best suited for estimating the effects on costs of marginal changes in permitting workload. To the extent that the replacement package leads to a non-marginal increase in permitting workload (as this study predicts), then unit and fixed costs for permit processing might also change significantly.

4.5 ADDENDUM

The large increase in standard permits predicted by the "Cost Analysis for the 2000 Issuance and Modification of Nationwide Permits" was not observed during the first year of implementation for these nationwide permits. A small shift in issued nationwide permits to issued standard permits appears to be evident after the effective date of the replacement nationwide permits, when the first three quarters of FY 2001 are compared to the first three quarters of FY 2000.

An increase in the number of days that is required to evaluate a standard permit application was observed. However, this increase may be due to factors other than the terms and conditions of the replacement nationwide permits. The large year-to-year variability in summary data for the Corps permit program may mask any changes in permitting that may have occurred as a result of the implementation of the new and modified nationwide permits that replaced nationwide permit 26. Also, it may take some time for effects of the replacement nationwide permits to become fully evident. Some early permitting trends following implementation of the replacement permits may be masked by applications submitted prior to the replacement package that are issued subsequent to the replacement package. In other cases, prospective applicants may simply take some time to respond to the permit process changes. As indicated earlier, behavioral response on the part of the permit applicant was not estimated.

Permit carryover (pending standard permit applications) has increased in a manner similar to the increases in average evaluation days. The Cost Analysis Report estimates an increase in permit carryover and the increased permitting budget that the Corps would need to reduce the effect on permitting activity of implementing the nationwide permit replacement package. Two items should be noted. First, the estimated increased budget will not eliminate the year-to-year carryover. Rather, it would address the increasing carryover, or backlog by reducing that carryover to levels that occurred prior to implementation of the replacement nationwide permits. Second, other factors can contribute to increasing average evaluation days and carryover, such as increased Endangered Species Act (ESA) coordination requirements (due to a greater number of ESA listings), coordination for activities that may affect historic properties an other cultural resources, and Essential Fish Habitat coordination requirements.

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APPENDIX A

OVERVIEW OF REPLACEMENT PACKAGE PROVISIONS

Table A1. Summary of March 9, 2000, New and Modified Nationwide Permits

NWP No./ Activity	Acre/ LF Limit	PCN Threshold/ Requirements	Scope of Applicable Waters	Other Requirements Associated with New & Modified General Conditions
Modified NWPs				
3 – Maintenance	Minimum Necessary (No change)	None	All Waters (No change)	**GC 25** requires notification for activities in designated Critical Resource Waters (DCRW) and adjacent wetlands. **GC 26** does not apply.
• **Removal of Accumulated Sediments** (Projects may have been authorized by NWP 26)	Minimum necessary, up to 200 feet from structure	All	All Waters	
• **Restoration of upland areas damaged by storms** (Projects may have been authorized by NWP 26)	Restore uplands to original location; up to 50 cubic yards dredging to remove obstructions	All	All Waters	
7 – Outfall Structures & Maintenance	Minimum Necessary	All (No Change)	All Waters (No change)	**GC 25** prohibits discharges into DCRW and adjacent wetlands. **GC 26** does not apply.
12 – Utility Line Activities	0.5 acre	Mechanized landclearing of forested wetland **for utility line right-of-way**; utility lines in Section 10 waters; utility lines in waters of the U.S., **excluding overhead lines,** for a distance of more than 500 feet; utility lines installed in waters of the U.S. parallel to stream bed. PCN for any discharges resulting in permanent above-grade fills in waters of the US in the 100 year floodplain (GC 26). PCN must include delineation of special aquatic sites.	All Waters (No change)	**GC 9** requires WQ Management Plan (WQMP) if not already required. **GC 21** – work must maintain pre-construction flows and reduce flooding and erosion. **GC 25** prohibits discharges into DCRW and adjacent wetlands. **GC 26** requires prospective permittees to submit a PCN to the District Engineer. The PCN must include documentation that the proposed work complies with FEMA or FEMA-approved local floodplain construction requirements.
• **Substations** (Projects may have been authorized by NWP 26)	0.5 acre	0.1 acre PCN must include delineation of special aquatic sites.	Non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters	
• **Tower Foundations** (Projects may have been authorized by NWP 26)	Minimum necessary	None PCN must include delineation of special aquatic sites.	All waters	
• **Permanent Access Roads** (Projects may have been authorized by NWP 26)	0.5 acre	Permanent above grade access roads >500 LF in waters. PCN must include delineation of special aquatic sites.	Non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters	

Table A1. Summary of March 9, 2000, New and Modified Nationwide Permits (continued)

14 – Linear Transportation Crossings • **Public**	0.5 acre for non-tidal waters, excluding non-tidal wetlands adjacent to tidal waters; 0.33 acre and 200 LF in tidal waters and non-tidal wetlands adjacent to tidal waters	0.1 acre; all discharges into special aquatic sites. PCN for any discharges resulting in permanent above-grade fills in waters of the US in the 100 year floodplain (GC 26). PCN must include: mitigation proposal for permanent losses, statement describing how temporary losses are minimized, and delineation of special aquatic sites.	**Large public projects** – non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters **Small public projects** – All other Waters	**GC 9** requires WQMP if not already required. **GC 21** – work must maintain pre-construction flows and reduce flooding and erosion. **GC 25** prohibits discharges in DCRW and adjacent wetlands. **GC 26** requires prospective permittees to submit a PCN to the District Engineer. The PCN must include documentation that the proposed work complies with FEMA or FEMA-approved local floodplain construction requirements.
• **Private**	0.33 acre/200 LF		All Waters (No Change)	
27 – Stream and Wetland Restoration Activities	No acreage limit (No Change)	PCN required only for activities that are not on Federal land, or do not have agreements with FWS, NRCS, OSM (Office of Surface Mining), or state mining agency.	All Waters (No Change)	**GC 21** – work must maintain pre-construction flows and reduce flooding and erosion. **GC 25** requires notification for all discharges into DCRW and adjacent wetlands. **GC 26** does not apply.
40 Agricultural Activities (Projects may have been authorized by NWP26)	0.5 acre for discharges into non-tidal wetlands to improve production; 0.5 acre for farm buildings; 300 linear foot limit for relocating drainage ditches constructed in non-tidal streams.	NRCS participants submit report to Corps w/in 30 days. All others >0.1 acre. PCN must include: delineation of affected wetlands and compensatory mitigation proposal.	Non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal wetlands; non-tidal streams	**GC 9** requires WQMP if not already required. **GC 21** – work must maintain pre-construction flows and reduce flooding and erosion. **GC 25** prohibits discharges into DCRW and adjacent wetlands. **GC 26** prohibits the use of NWP to authorize permanent above grade fills in waters of the US within mapped 100 year floodplains below headwaters. In headwaters: in floodway, no permanent above-grade fills in waters of the U.S.; in flood fringe, must demonstrate that proposed work complies with FEMA or FEMA-approved local floodplain construction requirements.
NEW NWPs				
39 – Residential, Commercial, and Industrial Developments (Projects may have been authorized by NWP26)	0.5 acre; 300 linear foot limit for filling or excavating stream beds	>0.1 acre, all discharges into open waters below the OHWM. PCN must include: avoidance and minimization statement; delineation of special aquatic sites; compensatory mitigation proposal.	Non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters	**GC 9** requires WQMP if not already required. **GC 21** – work must maintain pre-construction flows and reduce flooding and erosion. **GC 25** prohibits discharges into DCRW and adjacent wetlands. **GC 26** prohibits the use of NWP to authorize permanent above grade fills in waters of the US within mapped 100 year floodplains below headwaters. In headwaters: in floodway, no permanent above-grade fills in waters of the U.S.; in flood fringe, must demonstrate that proposed work complies with FEMA or FEMA-approved local floodplain construction requirements.

Table A1. Summary of March 9, 2000, New and Modified Nationwide Permits (continued)

41 – Reshaping Existing Drainage Ditches (Projects may have been authorized by NWP 26)	None	PCN required if reshaping >500 LF of drainage ditch.	Non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters	**GC 21** – work must maintain pre-construction flows and reduce flooding and erosion. **GC 25** and **GC 26** do not apply.
42 – **Recreational Facilities** (Projects may have been authorized by NWP 26)	0.5 acre; 300 linear foot limit for filling or excavating stream beds	>0.1 acre PCN must include: delineation of special aquatic sites; compensatory mitigation proposal.	Non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters	**GC 9** requires WQ Management Plan if not already required. **GC 21** – work must maintain pre-construction flows and reduce flooding and erosion. **GC 25** prohibits discharges into DCRW and adjacent wetlands. **GC 26** prohibits the use of NWP to authorize permanent above grade fills in waters of the US within mapped 100 year floodplains below headwaters. In headwaters: in floodway, no permanent above-grade fills in waters of the U.S.; in flood fringe, must demonstrate that proposed work complies with FEMA or FEMA-approved local floodplain construction requirements.
43 – **Stormwater Management Facilities** (Projects may have been authorized by NWP 26)	0.5 acre for new SWM facilities; 300 linear foot limit for filling or excavating stream beds; no limit for maintenance	>0.1 acre PCN must include: delineation of special aquatic sites; compensatory mitigation proposal; maintenance plan; avoidance and minimization statement.	Non-tidal waters of the U.S., excluding non-tidal wetlands adjacent to tidal waters	**GC 9** requires WQ Management Plan if not already required. **GC 21** – work must maintain pre-construction flows and reduce flooding and erosion. **GC 25** prohibits discharges into DCRW and adjacent wetlands. **GC 26** prohibits the use of NWP to authorize permanent above grade fills in waters of the US within mapped 100 year floodplains below headwaters. In headwaters: in floodway, no permanent above-grade fills in waters of the U.S.; in flood fringe, must demonstrate that proposed work complies with FEMA or FEMA-approved local floodplain construction requirements.
44 – Mining Activities • Aggregate • Hard rock/mineral (Projects may have been authorized by NWP 26)	0.5 acre.	All Activities. PCN must include: description of waters of the U.S. impacted by the proposed work; statement of avoidance and minimization; description of measures to minimize adverse affects to waters; reclamation plan for certain mining activities.	• Aggregate Mining: limited to isolated waters, <1cfs streams, non-tidal wetlands adjacent to headwater streams, and lower perennial streams, excluding wetlands adjacent to lower perennial streams • Hard Rock/Mineral Mining: limited to isolated waters and non-tidal wetlands adjacent to headwater streams	**GC 9** requires WQ Management Plan if not already required. **GC 21** – work must maintain pre-construction flows and reduce flooding and erosion. **GC 25** prohibits discharges into DCRW and adjacent wetlands. **GC 26** prohibits the use of NWP to authorize permanent above grade fills in waters of the US within mapped 100 year floodplains below headwaters. In headwaters: in floodway, no permanent above-grade fills in waters of the U.S.; in flood fringe, must demonstrate that proposed work complies with FEMA or FEMA-approved local floodplain construction requirements.

Table A2. Summary of March 9, 2000, NWP General Conditions.
Not all modified General Conditions are discussed.

General Condition No.	Title	Affected NWPs	Requirement
Modified			
9	*Water Quality*	NWPs 12, 14, 17, 18, 32, 39, 40, 42, 43, and 44	A water quality management plan (WQMP) must be adopted if necessary to ensure that the activities authorized by those NWPs will have no more than minimal adverse effects on water quality. If state or local requirements are adequate, the Corps does not have to require a WQMP.
13	*Notification*	All NWPs requiring PCN	The Corps can request additional information to make PCN complete only once and must do so within 30 days. Upon receipt of complete PCN, Corps has 45 days to determine if proposed work is authorized by NWP. Agency coordination is required only for those reporting NWPs that result in the loss of greater than 0.5 acre of waters of the U.S. Agencies will have a total of 25 days to provide comments to the Corps. In addition, a delineation of special aquatic sites must now be submitted with PCNs for NWPs 7, 12, 14, 18, 21, 34, 38, 39, 40, 41, 42, and 43. Either a conceptual or detailed mitigation plan may be submitted with the PCN.
19	*Mitigation*	All NWPs requiring PCN	Requires on-site avoidance and minimization to the maximum extent practicable. Corps can require compensatory mitigation to offset the adverse effects to the aquatic environment and ensure that the net impacts are minimal. Vegetated buffers may be part of the compensatory mitigation if there are open waters on the site; the DE determines the width of the vegetated buffer. If compensatory mitigation for wetland impacts is required and there are open waters on site, vegetated buffers will constitute no more than 1/3 of remaining compensatory mitigation after the permanently filled wetlands have been replaced on one-to-one acreage basis.
21	*Management of Water Flows*	All NWPs	To the maximum extent practicable, project must be designed to maintain preconstruction downstream flow conditions and reduce adverse effects such as flooding or erosion.
New			
25	*Designated Critical Resource Waters*	All NWPs except NWPs 1, 2, 4, 5, 6, 9, 11, 20, 24, 32, 41	Condition applies to designated Critical Resource Waters and adjacent wetlands. Prohibits use of NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44. PCN required for NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38.
26	*Fills within 100-Year Floodplains*	NWPs 12, 14, 29, 39, 40, 42, 43, 44	Condition applies only to floodplains identified on FEMA's Flood Insurance Rate Maps or FEMA-approved local floodplain maps. For NWPs 12 and 14, applicants must demonstrate that activity complies with FEMA or FEMA-approved local floodplain construction requirements. Below headwaters, prohibits use of NWPs 29, 39, 40, 42, 43, and 44 to authorize permanent above grade fills in 100-year floodplain. In headwaters, prohibits use of NWPs 29, 39, 40, 42, 43, and 44 to authorize permanent above grade fills in floodway of 100-year floodplain. In headwaters, NWPs 29, 39, 40, 42, 43, and 44 can be used to authorize permanent above grade fills in flood fringe of 100-year floodplain, as long as activity complies with FEMA or FEMA-approved local floodplain construction requirements.

APPENDIX B

Estimation of Permitting Changes

B.1 Introduction

The data, methods and assumptions used to estimate the number of nationwide permit (NWP) activities that would now need to obtain standard permit (SP) authorization under the replacement package (as reported in Table 2.1 of Section 2) are reviewed below. The study data is described in Section B.2. Sections B.3 and B.4 describe estimation of permitting effects for activities previously authorized under NWP 26. Section B.5 describes estimation of permitting effects for activities previously authorized under nationwide permits other than NWP 26. Sections B.6 and B.7 describe the estimation of shifting factors used to calculate the effects of General Condition 25 (Designated Critical Resource Waters) and General Condition 26 (Fills Within 100-Year Floodplains), respectively, on activities previously authorized under nationwide permits that otherwise would qualify for NWP authorization under the replacement package.

B.2 FY 98 Data

The study relied on Corps regulatory field data contained in the Corps "Regulatory Analysis Management System" (RAMS) database. Fiscal year 1998 (FY 98) data from 35 of the total 38 Corps districts were used to estimate permitting changes under the replacement package. Charleston, Honolulu, and New England districts did not provide data. Of these three districts, only Charleston is likely to have had a significant number of nationwide permits in FY 98.

The data set used for the analysis reported here is more complete than the data set used in the *Cost Analysis for the 1999 Proposal to Issue and Modify Nationwide Permits* released by the Corps in March 2000. That previous analysis relied on FY 98 data downloaded from RAMS in December 1999, whereas the analysis reported here used FY 98 data downloaded from RAMS in April 2000. The April 2000 data set contained 867 more NWP activity identifications (or "Actids") than the December 1999 data, and was more complete in terms of entries in the available data fields. Almost all (99%) of the differences between the two data sets can be attributed to Wilmington, Jacksonville, New York, and Omaha districts. In the April 2000 data set, the Wilmington District reported 352 more NWP activities, Jacksonville district reported 211 more NWP activities, New York district reported 200 additional NWP activities, and Omaha district reported 95 more NWP activities.

B.3 Number of FY 98 NWP 26 Authorizations by Activity Type

For each district, the data on FY 98 NWP 26 authorizations were sorted by "Actid" and then by "Activity Type". The number of NWP 26 authorizations was determined for each activity type by counting the number of Actids that had either a "Final Permit Decision" that was "Issued," or a "Nationwide Permit Final Decision" that was "Verified." Tallying across districts for each activity type provided the total number of authorizations in FY 98, as reported in Table 2.1 in Section 2 of this report.

B.4 Estimation of Permit Shifts Involving of FY 98 NWP 26 Authorizations

Estimation of the number of FY 98 NWP 26 authorizations that would be required to obtain SP authorization under the replacement package is discussed below. The discussion is organized by the new or modified NWPs to which NWP 26 activities would be shifting.

B.4.1 Authorizations with No New or Modified NWP

All NWP 26 authorizations that are not accommodated by the new or modified NWPs were assumed to shift to SP. These include the Silvicultural, Impoundment, and Treatment categories, as well as 18.3% of the authorizations in the Other category. The data provided by the districts did not further differentiate the "Other" NWP 26 activities. Disaggregated data for the "Other" category were available for May 1,

1997 through December 31, 1997. Within that data set, 2.2% of the Other authorizations were for ponds, 1.7% were for levees/dams, 8.1% were for erosion/stabilization, 20.9% were for channel work/cleanout authorizations, and 6.3% were miscellaneous, none of which have an accommodating new or modified NWP. The FY 98 NWP 26 authorizations in each district were assumed to follow the same distribution.

B.4.2 Authorizations Accommodated by NWP 39

All authorizations in the Institutional, Retail Individual, Retail Multiple, Residential Multiple, and Industrial categories could potentially qualify for the new NWP 39. The single unit housing and parking lot authorizations within the Other category could also potentially qualify for NWP 39. Based on the disaggregated Other data, 41.1% of the authorizations from the Other category were for these two kinds of projects — 36% were single unit housing projects and 5.1% were parking lots.

NWP 39 has a 1/2-acre limit, as well as a 300 linear foot limit for filling and excavating streambeds. Within each district, the permitted acreage and linear feet impacts of each Institutional, Retail Individual, Retail Multiple, and Industrial authorization were compared to their respective acreage and linear foot limits to determine if that authorization would have to apply for a SP or would qualify for NWP 39.

Those authorizations with impacts below the acreage and linear foot limits were then subjected to screens relating to the NWP prohibitions imposed by General Condition 25 (GC 25) and General Condition 26 (GC 26). Development of shifting factors to represent the effects of GC 25 and GC 26 is described in Section B.6 and B.7, respectively.

GC 25 limits the use of NWP 39 to authorize discharges of dredged or fill material into designated critical resource waters and adjacent wetlands. Of those NWP 39 activities that did not shift to SP as a result of the acreage limit or the linear foot limit, 0.01 were assumed to shift to SP due to GC 25. GC 26 prohibits the use of NWP 39 to authorize permanent, above-grade fills in waters of the United States within 100-year floodplains below headwaters. For each authorization below headwaters that had not shifted to SP due to the acreage and linear foot limits, 0.28356 permits were assumed to shift to SP as a result of GC 26. In 100-year floodplains in headwaters, GC 26 prohibits the use of NWP 39 to authorize permanent, above-grade fills in waters of the United States within floodways, but NWP 39 can be used to authorize permanent, above-grade fills in waters of the United States in the flood fringe, provided the activity complies with FEMA or FEMA-approved local floodplain construction requirements. All NWP 39 activities were assumed to result in permanent, above-grade fills. Therefore, for each authorization in headwaters or in isolated waters that had not shifted to SP due to the acreage and linear foot limits, 0.01701 permits were assumed to shift to SP due to GC 26.

For each activity category, the total number of authorizations shifting to SP was estimated by summing those shifting due to NWP 39 acreage and linear foot limits, those shifting due to GC 25, and those shifting due to GC 26. Summing across all districts provides an estimate of the total number of authorizations within each category that would require a SP under the 2000 NWP package.

Authorizations within the Other NWP 26 category were analyzed in a similar manner. For single unit housing and parking lot activities, the permitted acreage and linear feet impacts of each Other authorization were compared to the NWP 39 acreage and linear foot limits. When an Other authorization exceeded the NWP 39 limits, 0.411 permits (0.36 permits for single unit housing and 0.051 permits for parking lots) were assumed to shift to SP. For authorizations that did not exceed the acreage and linear foot limits, 0.00411 (0.0036 permits for single unit housing and 0.00051 permits for parking lots) were assumed to shift to SP as a result of GC 25. If an authorization did not exceed the single unit housing (parking lot) threshold and was located below headwaters 0.10208 (0.01446) permits were assumed to

shift to SP due to GC 26.[1] Likewise, GC 26 shifted 0.00612 (0.00087) permits to SP for authorizations located in headwaters qualifying for NWP 39 based on the single unit housing (parking lot) limits.

B.4.3 Authorizations Accommodated by NWP 40

The modified NWP 40 authorizes more activities than the NWP 40 issued in 1996. It was assumed that none of the NWP 26 authorizations in FY 98 in the Agricultural category were for farm building pads – these activities are already covered by the current NWP 40 and presumably would have been recorded as NWP 40 permits if they had been for farm building pads. Authorizations with permitted impacts greater than 1/2 acre or 300 linear feet of streambed were assumed to shift to SP. The agricultural authorizations that did not shift to SP as a result of the acreage and linear foot limits were then subjected to GC 25 and GC 26 in the same manner described in Section B.4.2.

B.4.4 Authorizations Accommodated by NWP 42

Using data from May 1, 1997 through December 31, 1997, 9.5% of FY 98 authorizations in the Other category were assumed to be for recreational facilities, and would therefore potentially qualify for NWP 42. For each Other authorization with impacts greater than 1/2 acre or 300 linear feet of streambed, 0.095 permits were assumed to shift to SP due to the limits of NWP 42. The remaining recreational facility authorizations were then subjected to GC 25 and GC 26 in the same manner described in Section B.4.2.

B.4.5 Authorizations Accommodated by NWP 43

Authorizations in the Storm Water category with acreage impacts exceeding 1/2 acre or 300 linear feet of streambed shifted to SP due to the limits of NWP 43. Those activities with impacts less than or equal to 1/2 acre or 300 linear feet of streambed were subjected to GC 25 and GC 26 in the same manner described in Section B.4.2.

B.4.6 Authorizations Accommodated by NWP 44

Authorizations in the Mining Aggregates and Mining Other categories with acreage impacts exceeding 1/2 acre shifted to SP due to the limits of NWP 44. Those with impacts less than or equal to 1/2 acre were subjected to GC 25 and GC 26 in the same manner described in Section B.4.2.

B.4.7 Authorizations Accommodated by NWP 3

Authorizations for cleanout work were assumed to potentially qualify for NWP 3. Using data from May 1, 1997 through December 31, 1997, the percentage of the Other authorizations for channel work/cleanout was determined (20.9%). For each authorization with linear impacts exceeding 200 feet (the new NWP 3 linear limit for cleanout work) 0.209 permits were assumed to shift to SP. GC 25 and GC 26 do not pertain to activities authorized by NWP 3.

B.4.8 Activities Accommodated by NWP 12

All NWP 26 authorizations in FY 98 for utility lines are assumed to potentially qualify for NWP 12. Using data from May 1, 1997 through December 31, 1997, the percentage of authorizations in the Other category for utility lines was estimated to be 5.6%. For each authorization in the Other category with impacts greater than 1/2 acre, 0.056 were assumed to shift to SP due to the new NWP 12 limits. Those activities with impacts less than or equal to 1/2 acre were subjected to GC 25 in the same manner

[1] The single unit housing factor is 0.10208=0.36*0.28356. The parking lot factor is 0.01446=0.051*0.28356.

described in Section B.4.2. For the purposes of GC 26, it was assumed that all utility line activities within 100-year floodplains would be constructed in compliance with FEMA or FEMA-approved local floodplain construction requirements, and therefore would not shift to SP.

B.4.9 Activities Accommodated by NWP 14

All NWP 26 authorizations in FY 98 in the Transportation category are assumed to potentially qualify for NWP 14. Each transportation activity that exceeded 1/2 acre was assumed to shift to SP. Those activities with impacts less than or equal to 1/2 acre were subjected to GC 25 in the same manner described in Section B.4.2. For the purposes of estimating the effects of General Condition 26, it was assumed that all transportation activities within 100-year floodplains would be constructed in compliance with FEMA or FEMA-approved local floodplain construction requirements, and therefore would not shift to SP.

B.4.10 Activities Accommodated by NWP 27

All NWP 26 authorizations in FY 98 for wildlife habitat are assumed to potentially qualify for NWP 27. Using data from May 1, 1997 through December 31, 1997, the percentage of authorizations in the Other category for wildlife habitat activities was estimated to be 4.6%. Since the modified NWP 27 does not have an acreage limit, no shifts to SP would occur. Also, GC 25 and GC 26 do not apply to NWP 27.

B.4.11 Activities Accommodated by NWP 29

In the August 30, 1999, issue of the *Federal Register* (64 FR 47175), the acreage limit of NWP 29 was reduced from 1/2 acre to 1/4 acre. Since this modification of NWP 29 occurred during the development of the new and modified NWPs that replaced NWP 26, and the new acreage limit of NWP 29 affects the number of SPs processed by the Corps, the 1/4 acre limit of this NWP was included in this analysis. Each NWP 29 activity that exceeded 1/4 acre was assumed to shift to SP. Those activities with impacts less than or equal to 1/4 acre were then subjected to GC 25 and GC 26 in the same manner described in Section B.4.2.

B.5 Estimation of Shifts Involving Other NWP Authorizations

In addition to replacing NWP 26 with five new NWPs, several nationwide permits were modified, namely NWPs 3, 7, 12, 14, 27 and 40. Of these permits, only the modifications to NWP 12 are likely to affect activities that were authorized under the 1996 NWP program. The 1/2-acre limit imposed on NWP 12 activities is likely to result in some activities that were previously authorized by NWP 12 shifting to SP. Activities authorized by the other modified NWPs (i.e., NWPs 3, 7, 14, 27, and 40) would still qualify for their respective NWPs under the 2000 NWP package, prior to being subject to GC 25 and 26, if those general conditions apply to those NWPs. In addition, some of the other NWPs (e.g., NWP 21) that were not modified by the 2000 NWP package may shift to SP as a result of GC 25. Shifts in other NWPs due to GC 25 were analyzed in the same manner as the NWP 26 GC-induced shifts described above.

B.6 Estimation of Authorizations Affected by General Condition 25 (Critical Resource Waters)

GC 25 prohibits the use of NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44 to authorize discharges of dredged or fill material into designated critical resource waters and wetlands adjacent to those waters. Designated critical resource waters include: NOAA-designated marine sanctuaries, National Estuarine Research Reserves, National Wild and Scenic Rivers, critical habitat for Federally listed endangered and threatened species, coral reefs, State natural heritage sites, and outstanding national resource waters or other waters officially designated by a State as having particular environmental or

ecological significance and identified by the District Engineer after notice and opportunity for public comment.

To estimate the number of NWP activities that would be prohibited by GC 25, it was assumed that 1.0% of all FY 98 NWP activities that otherwise would qualify for a NWP under the replacement package would be required to obtain SP authorization as a result of GC 25. This estimate is based on a review of available data and information on the different categories of critical resource waters and their potential intersection with activities authorized under the affected NWPs, as discussed below.

In certain types of waters, the number of activities potentially prohibited from using NWPs by GC 25 is very small. For example, only 0.65% of the verifications for NWPs 7, 12, 14, 16, 31, and 35 that were issued in FY 98 were for activities in estuarine or marine waters; the other NWPs listed in paragraph (a) of GC 25 cannot be used in estuarine or marine waters. No data could be found that indicates the possible share of jurisdictional waters of the US accounted for by State natural heritage sites, outstanding national resource waters, and or waters officially designated by a state as having particular environmental or ecological significance. However, it is believed that these waters together account for a very minor share of jurisdictional waters, and thus likely intersect with a corresponding minor share of NWP activities.

The number of NWP activities that would be prohibited by GC 25 because they intersect with critical habitat for Federally listed endangered and threatened species is also likely to be very small. This is because GC 25 does not generally prohibit such activities, but rather only requires concurrence from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service that the proposed work complies with General Condition 11 (Endangered Species). General Condition 11 states that the NWPs cannot be used to authorize activities that are likely to jeopardize the continued existence of Federally-listed endangered or threatened species or will destroy or adversely modify the critical habitat of such species. Also, the authorization of an activity by an NWP does not authorize the "take" of a Federally-listed endangered or threatened species. Since compliance with General Condition 11 is required for all NWP activities, the net effect of the GC 25 prohibition on NWP activities that occur in these waters (above and beyond the effect of General Condition 11) is thus likely to be very minor.

Most of the NWPs affected by GC 25 could be used to authorize activities in National Wild and Scenic Rivers, and adjacent wetlands. Data from the National Park Service indicates that there are 11,276 river miles in the United States that are designated as components of the National Wild and Scenic Rivers System (source: http://www.nps.gov/rivers/wildriverstable.html). Since there are approximately 3,660,000 river miles in the United States (source: *National Water Quality Inventory: 1998 Report to Congress*, published by USEPA), approximately 0.31% of those river miles are designated as Wild and Scenic Rivers.

The above review of the available data on the different categories of critical resource waters and their potential intersection with activities authorized under the affected NWPs suggests that in aggregate GC 25 would affect no more than 1.0% of NWP activities. Thus, it was assumed that a total of 1.0% of all FY 98 NWP activities that would otherwise qualify for NWP authorization under the replacement package would now be required to obtain (shift to) SP authorization.

B.7 Estimation of Authorizations Affected by General Condition 26 (Fills within 100-year Floodplain)

GC 26 restricts the use of certain NWPs to authorize discharges of dredged or fill material into jurisdictional waters within 100-year floodplains identified through the Federal Emergency Management Agency's (FEMA's) Flood Insurance Rate Maps or FEMA-approved local floodplain maps. For discharges *below* headwaters, GC 26 prohibits the use of NWPs 29, 39, 40, 42, 43, and 44 to authorize permanent above-grade fills in jurisdictional waters within mapped 100-year floodplains. GC 26 does not

prohibit the use of NWPs 12 and 14 in mapped 100-year floodplains located below headwaters provided that the permit applicant submits a notification to the District Engineer that demonstrates the proposed work complies with FEMA or FEMA-approved local floodplain construction requirements.

For discharges *in* headwaters, GC 26 prohibits the use of 29, 39, 40, 42, 43, and 44 to authorize permanent above-grade fills in jurisdictional waters located within *floodways* of mapped 100-year floodplains. A floodways is defined as that portion of the 100-year floodplain that carries most of the water during a 100-year flood event. NWP 12 and NWP 14 can be used to authorize activities within floodways, provided those activities comply with FEMA or FEMA-approved local floodplain construction requirements. Similarly, GC 26 does not prohibit the use of NWPs 29, 39, 40, 42, 43, and 44 to authorize permanent above-grade fills in waters of the United States within the flood *fringe* (that portion of mapped 100-year floodplains that is not classified as floodway), provided these activities comply with FEMA or FEMA-approved local floodplain construction requirements.

Estimation of the share of FY 98 NWP activities affected by GC 26 relied on the following pieces of information:

- Of the approximately 100 million acres of inland wetlands remaining in the US as of 1997, 50.7 million acres are classified as forested wetlands (Source: Dahl, T.E. 2000. *Status and trends of wetlands in the conterminous United States: 1986 to 1997*. US Fish and Wildlife Service.)
- There are 178.8 million acres of land area in the US within 100-year floodplains [Source: US Water Resources Council (1977) as cited by: Federal Interagency Floodplain Management Task Force. 1992. *Floodplain management in the United States: An assessment report.*]
- There are approximately 100 million acres of mapped 100-year floodplains in the US, and 6 million acres are mapped as floodway (Source: Association of State Floodplain Managers. 2000. *The nation's response to flood disasters: A historical account*. Madison, WI)

Using the data elements cited above, the following assumptions and calculations were used to estimate the shares of FY 98 NWP activities that would be prohibited from using NWPs as a result of GC 26:

1. There are 50.7 million acres of wetlands with 100-year floodplains. This estimate is based on an assumed one-to-one correspondence between forested wetlands and wetlands within 100-year floodplains.

2. There are 28.356 million acres of wetlands within mapped 100-year floodplains. This estimate is calculated by multiplying the share of 100-year floodplains that are mapped, 55.9% (100/178.8), by the total area of wetlands assumed to be located within 100-year floodplains, 50.7 million acres.

3. There are 1.701 million acres of wetlands within floodways of mapped 100-year floodplains. This estimate is calculated by multiplying the share of mapped 100-year floodplains that are floodways, 6%, by the 28.356 million acres of wetlands estimated to coincide with mapped 100-year floodplains.

4. The estimated 100 million acres of inland wetlands remaining in the US represents the total area of jurisdictional "waters of the United States". Thus, approximately 28.356% of jurisdictional waters coincide with mapped 100-year floodplains (28.356/100), and 1.7% of jurisdictional waters coincide with floodways within mapped 100-year floodplains (1.7/100).

5. There is a one-to-one correspondence between the share of jurisdictional waters estimated to coincide with mapped 100-year floodplains (28.356%) and the share of FY 98 NWP activities located below headwaters that would shift to SP as a result of the prohibition on discharges below headwaters.

6. There is a one-to-one correspondence between the share of jurisdictional waters estimated to coincide with floodways of mapped 100-year floodplains (1.7%) and the share of FY 98 NWP activities located in headwaters that would shift to SP as a result of the prohibition on discharges in headwaters.

7. Those FY 98 NWP activities qualifying for modified NWPs 12 and 14 are assumed to be in compliance with FEMA and FEMA-approved local floodplain construction requirements, and thus would not be prohibited by GC 26.

8. Those FY 98 NWP activities qualifying for NWPs 29, 39, 40, 42, 43, and 44 that were located within the flood fringe of 100-year mapped are assumed to be in compliance with FEMA or FEMA-approved local floodplain construction requirements and thus would not be prohibited by GC 26.

APPENDIX C

Estimation of Corps Administrative Costs

C.1 Introduction

It was hypothesized that the amount of each district's annual operating budget dedicated to permitting is dependent on the number and types of permits that the district processes per year. Equation (C.1) represents the hypothesized relationship.

(C.1) $\text{Annual Permit Budget}_d = \beta_0 + \beta_1 * SP_d + \beta_2 * LOP_d + \beta_3 * RGP_d + \Sigma_i \beta_i * NWP_{id}$

Where:

Subscript d refers to the district
Subscript i refers to nationwide permit number
β_0 refers to the intercept
$\beta_{1, etc}$ refer to coefficients (costs) for respective permit types
Annual Permit Budget = annual amount spent on permitting
SP = number standard individual permits processed per year
LOP = number letters of permission processed per year
RGP = number regional general permits processed per year
NWP_i = number of nationwide permit i processed per year

As there are only 38 districts and equation (C.1) has 43 independent variables, the equation cannot be estimated using a single year of data.[1] At the drafting of this report, district-level budget data were only available for FY 98. To overcome the data constraints, equation (C.2) was specified.

(C.2) $\text{Annual Permit Budget}_d = \beta_0 + \beta_1 * \text{SP-LOP-RGP DUM}_d + \beta_2 * \text{SP-LOP}_d + \beta_3 * NWP_d + \beta_4 * RGP_d + \beta_5 * REC_d$

Where:

Subscript d refers to the district
$\beta_{1, etc}$ refer to coefficients (costs) for respective permit variables
Annual Permit Budget = annual amount spent on permitting
SP-LOP-RGP DUM = 1 if the district processed more SP+LOP than NWP and the district processes more RGP than NWP, 0 otherwise
SP-LOP = number standard permits plus number of letters of permission processed per year
NWP = number of nationwide permits processed per year
RGP = number regional general permits processed per year
REC = number of standard permits plus number of letters of permission *received* per year

The first two elements of equation (C.2) can be interpreted as a district's fixed costs of operating a permit program. The second element asserts that districts that issue other permit types more often than nationwide permits face different fixed costs than districts that rely more heavily on nationwide permits. The third element asserts that all individual permits cost the same amount to process. The fourth element asserts all nationwide permits cost the same amount to process. The fifth element asserts that all regional general permits cost the same amount to process. The final element asserts that the Corps incurs administrative costs when it receives a standard permit or

[1] One year provides 38 observations which is less than the number of variables. Two years data provide 76 observations (two per district), sufficient to estimate equation C.1

letter of permission application, apart from the cost to process these individual permits. This recognizes that SP applications received impose administrative costs even if they are eventually withdrawn and thus never processed.

C.2 Estimation, Results, and Interpretation

Data for the dependent variable in equation (C.2) were derived from the Corps' FY 98 Fund Availability Statement. Of the $104.8 million dollars in "Obligations Incurred" by all districts in FY 98, $80.1 million (76.4%) were for permitting. For each district, the amount of "Obligations Incurred" in FY 98 was multiplied by 0.764 to estimate the district's annual permit budget. Data for the dependent variables were from the RAMS database. [2]

Equation (C.2) was estimated by ordinary least squares. The results of the estimation are presented in Table C1.

Table C1: Estimated Coefficients for Equation C.2

N = 37	$R^2 = 0.71$	Adj. $R^2 = 0.66$	F-Stat[3] = 15.16
Independent Variable	Estimated Coefficient	Standard Error	P-Value
Intercept	842009	181091	0.0000058
SP-LOP-RGP DUM	1179682	410203	0.0007225
SP-LOP	1492	584	0.0158153
NWP	389	111	0.0015320
RGP	206	76	0.0109725
REC	1076	621	0.0930238

As with any regression equation, the estimated coefficients in Table C.1 are sensitive to the specification of independent variables in and functional form of equation (C.2). From a statistical perspective, the results appear sound – the adjusted R^2 and F-statistic indicate the equation is explaining a substantial portion of the variation in the data, and the p-values indicate that all but one of the coefficients for the independent variables are significantly different than zero ($p = 0.05$). From an economic perspective, however, these results should be regarded as first-cut estimates and used with caution. That being said, the estimated equation produced the following results.

The estimated coefficients suggest that districts incur an additional $1,492 in obligations to process any SP or LOP application, over and above the fixed costs of the permitting program. The districts incur an additional $1492 in obligations for each SP and LOP processed. Processing a nationwide permit adds $389 to a district's obligations, and an RGP adds $206 in obligations per permit processed. The additional obligations per permit may be loosely interpreted as the average administrative cost of processing the permit.

[2] Data from the Alaska district was not included for this analysis because it was considered an outlier.
[3] The F-statistic indicates whether the equation is meaningful in the aggregate.

The estimated coefficient for the REC variable suggests that Corps districts incur a cost of $1,076 just to receive a SP/LOP application, apart from the cost of processing these applications. This recognizes that these applications impose costs on the Corps even if they are eventually withdrawn and thus never processed (issued or denied). This coefficient together with the SP-LOP coefficient suggests that the Corps incurs a total cost of $2,568 for each SP/LOP application received and processed.

The estimated coefficient for the dummy variable suggests that those districts that process more other types of permits than nationwide permits require about $1.17 million more obligations annually than districts that process more nationwide permits than other permit types. This may be loosely interpreted as the additional fixed costs needed when other permit types account for more than 50% of the districts permitting workload.